

Building Materials
and
Contractors' Equipment

Standard Salt & Cement Co.
DULUTH, MINN.

GENERAL CATALOG
OF
**Building Materials
and
Contractors' Equipment**

ESTABLISHED 1896

Standard Salt & Cement Co.

SAMUEL E. MATTER, PRESIDENT
ROGER M. WEAVER, VICE PRES. & SECY. JOHN C. JOHNSON, TREASURER

OFFICE, WAREHOUSES AND DOCK, 237 TO 249 SOUTH LAKE AVE,
Duluth, Minn.



FOREWORD

We present herewith our first, general catalogue describing as completely as possible, within the scope of this volume, our line of Building Materials and Contractors' Equipment.

It contains many of the best known staple and standard articles which we have distributed for over 25 years, while much thought and study has been given to the selection of the newer specialties also included.

Our line is very comprehensive although not as complete as we would like to have it, but our plan is to enlarge it from time to time in order to render you the greatest measure of service.

Whenever you wish materials or equipment not covered by this catalogue, won't you please write us, because additions made to our line, since going to press, may enable us to supply just what you need.

In selecting our sources of supply for both materials and equipment, our first consideration has always been the quality, reputation and dependability of the product itself, and second, to select only those manufacturers whose delivery and service measures up to the standards we have always endeavored to maintain.

May we suggest that you first examine this book carefully and see how well we are prepared to look after your needs, both in materials and modern, efficient contractors' equipment; then keep this book as your right hand guide for ready reference and remember—

It will always be a genuine pleasure to give you more detailed information on any subject listed herein and to figure with you on any of your possible requirements regardless of their size or volume.

Will you give us this opportunity?

STANDARD SALT & CEMENT COMPANY

PORTLAND CEMENT

We are headquarters in Duluth for the well known high quality Universal Portland Cement.

Universal Cement production during 1923 amounted to more than 160,000 sacks per day—more than enough to deposit one sack at every telegraph pole from New York to San Francisco.

One sack or Twenty Carloads always available for immediate delivery from our Warehouses.

A BETTER CEMENT

MADE IN DULUTH

FOR DULUTH BUILDERS



Present day construction demands the use of fire-safe, durable materials. One of these is concrete, low in first cost and in upkeep. Whether it's a chicken coop, barn, home or skyscraper you are building, it's good policy to protect yourself against fire losses by building with concrete.

Universal cement for concrete Concrete for permanence



UNIVERSAL CEMENT always conforms to the Standard Specifications of the American Society for Testing Materials and all City and State Highway Departments. *See Specifications on next page.*

OUR DULUTH Stock is carried in cloth bags, weight 94 lbs. net. Can ship in paper bags when required.

Universal Cement IN BULK — on large projects Bulk Cement often saves time and labor-- Pennsylvania Freight Terminal, Chicago used bulk Cement equalling 312,000 sacks.

Suggestions as to equipment for any specific job may be had on request.

RETURN OF CEMENT BAGS

All cloth cement bags are returnable, provided they are in usable condition, and will be credited in accordance with agreements made at time of sale.

PORTLAND CEMENT

The High Recognition accorded Portland Cement Concrete by the architectural and engineering professions is due primarily to its dependability. The outstanding reason for this dependability is the fact that its most important ingredient — Portland Cement — is *standardized*.

Universal Portland Cement is tested at every stage of its manufacture and must conform to the following specifications—Copies of complete standard specifications will be furnished on request.

Extract from STANDARD SPECIFICATIONS FOR PORTLAND CEMENT.

Definition.

1. Portland cement is the product obtained by finely pulverizing clinker produced by calcining to incipient fusion an intimate and properly proportioned mixture of argillaceous and calcareous materials, with no additions subsequent to calcination excepting water and calcined or uncalcined gypsum.

I. CHEMICAL PROPERTIES.

Chemical Limits.

2. The following limits shall not be exceeded:

Loss on ignition, per cent.....	4.00
Insoluble residue, per cent.....	0.85
Sulfuric anhydride (SO ₃), per cent.....	2.00
Magnesia (MgO), per cent.....	5.00

II. PHYSICAL PROPERTIES.

Specific Gravity.

3. The specific gravity of cement shall be not less than 3.10 (3.07 for white Portland cement). Should the test of cement as received fall below this requirement a second test may be made upon an ignited sample. The specific gravity test will not be made unless specifically ordered.

Fineness.

4. The residue on a standard No. 200 sieve shall not exceed 22 per cent by weight.

Soundness.

5. A pat of neat cement shall remain firm and hard, and show no signs of distortion, cracking, checking, or disintegration in the steam test for soundness.

Time of Setting.

6. The cement shall not develop initial set in less than 45 minutes when the Vicat needle is used or 60 minutes when the Gillmore needle is used. Final set shall be attained within 10 hours.

Tensile Strength.

7. The average tensile strength in pounds per square inch of not less than three standard mortar briquettes (see Section 50) composed of one part cement and three parts standard sand, by weight, shall be equal to or higher than the following:

Age at Test, days.	Storage of Briquettes	Tensile Strength lb. per sq. in.
7	1 day in moist air, 6 days in water	200
28	1 day in moist air 27 days in water	300

8. The average tensile strength of standard mortar at 28 days shall be higher than the strength at 7 days.

The above Extracts are taken from STANDARD SPECIFICATIONS & TESTS FOR PORTLAND CEMENT.
SERIAL DESIGNATION C - 9 - 21 — Copies of Complete Specifications will be furnished on Request.

These Specifications were Approved March 31, 1924 as "American Standard" by the American Engineering Standards Committee.

ALKAGEL "The Absolute Waterproofer"

In Paste Form—Integrally waterproofs concrete mortars, stucco, plaster, etc.

A MADE-IN-DULUTH PRODUCT

Waterproofing as a means of assuring the permanency of concrete structures has been recognized by the foremost architects and engineers of the day. Investigations during the last few years have proven that the permanency of concrete is impaired by the attack of moisture, alkali salts and weather conditions which bring about the deleterious action of alternate freezing and thawing within the concrete.

Investigation shows that water can enter concrete in two ways.

First—Absorption
Second—Percolation

Absorption can only occur when the pores in the concrete are the size of minute capillaries. When these capillaries become larger as in most concrete structures percolation of the water through the pores occurs. The problem of waterproofing then becomes twofold. The absorption must be cut down to nothing by the addition of a water repellant colloidal material, the large pores must be closed by making the concrete dense. This densifying effect cannot be brought about by the addition of surplus water because the addition of surplus water materially weakens the concrete and also increases the number of pores. Because of this we must resort to a material which by its lubricating effect upon the aggregate will make possible a uniform denser concrete.

Alkagel is an integral waterproofing which amply satisfies all these conditions. Alkagel is produced in several grades. Alkagel B No. 3 the grade used for mass concrete, such as foundations, floors, etc. is a water soluble colloid which lubricates the aggregate giving a dense, hard concrete and at the same time lining the minute capillaries with a water repellant film. By using Alkagel B No. 3, the concrete is made absolutely waterproof and at the same time the mixing water is diffused equally throughout the concrete, thus increasing the hydration of the cement and decreasing the necessity of superfluous mixing water to obtain plasticity.

Alkagel B No. 2 is the grade used for stucco and basement linings. This type of work requires an exceptional waterproofing as ordinarily the waterproofed surface is not over $\frac{1}{2}$ " thick. Alkagel B No. 2 besides waterproofing the cement mortar prevents hair checking, efflorescence and other exudations.

The cost of using Alkagel in safe-guarding concrete is very low. It is easy to use as it is merely mixed with the mixing water as per directions, and further as giving the contractor a "fat mix" it facilitates the handling and creates smooth, good-looking surfaces.

These are the main Alkagel products for waterproofing. However, special problems, such as alkali proofing, salt resisting and the waterproofing of gypsum plaster have been solved by the manufacture of other grades of Alkagel known as Al-

kagel A and Alkagel B No. 1. *Circulars on Request.*

None of the Alkagel compounds are affected by any of the natural disintegrating agencies like decomposition, oxidation, carbonization. It is unaffected by time and weather conditions. The Alkagel compounds are all strength increasing and give to the concrete an increased hardness.

If these waterproofing facts interest you we shall be pleased to send you pamphlets, data on tests, and co-operate with you in solving your problems the most inexpensive and effective way.

List of well-known buildings in North Eastern Minnesota, in which Alkagel products have been used, gladly furnished on request.

Any Quantity Available for Prompt Delivery

Ample stocks of Alkagel are carried in our Duluth Warehouses so that quick shipment can be made. In addition completion of the new factory for the manufacture of Alkagel products, right in Duluth, where these materials are manufactured in quantity and under the immediate supervision of the best cement experts of this part of the country, assures fresh goods absolutely uniform at all times.

Size and Style of Packages

Alkagel is put up in 50 gal wood barrels, half barrels containing 30 gals. and in 5 gal. cans.

Alkagel—in 50 gal. wood barrelsper gallon
Alkagel—in 30 gal. wood barrelsper gallon
Alkagel—in 5 gal. cansper gallon

Ask for quotations

Tables of Quantities Required

Mass Concrete Quantities of Materials for 1 cubic yard

Mixture	Sacks of Cement	Cu. Ft. of Sand	Cu. Ft. Gravel or Rock	Gallons of Alkagel
1st figure Cement				
2nd figure Sand				
3rd figure Gravel or Rock				
1—2—3	7.0	14.0	21.0	1.32
1—2—4	6.0	12.0	24.0	1.00
1—2½—5	5.0	12.5	25.0	.90

Cement Mortar—Materials required per 100 sq. ft.

MIXTURE	Thickness	Sacks of Cement	Cu. Ft. Sand	Gallons ALKAGEL
Cement—Sand				
1 — 2	½-in.	2.0	3.9	.80
	¾-in.	3.0	5.9	1.20
	1-in.	3.9	7.9	1.60
1 — 3	½-in.	1.5	4.6	.55
	¾-in.	2.3	6.9	.83
	1-in.	3.1	9.2	1.10

DIRECTIONS FOR USING ALKAGEL

Simply stir into the mixing water the required amount of Alkagel as per the above tables.

STANDARD SALT AND CEMENT COMPANY — DULUTH

WHITE PORTLAND CEMENT



UNITED STATES POST OFFICE
WASHINGTON, D. C.

White Bethel granite, terra cotta, and face brick set in White Portland Cement mortar.

White Portland Cement is always in Stock at our Duluth Warehouse, packed in cloth sacks, 94 lbs net weight.

We can ship immediately less than carloads, mixed car lots or straight cars. Takes mixed car rates with plaster, stucco, hydrated lime, etc.

Our White Portland Cement is non-straining and can cause no efflorescence on brickwork or stone.

Especially adapted for setting Bedford Limestone.

Identical with and conforms to "Standard Specifications for Portland Cement" but is free from the elements that cause the dark color.

SUGGESTED USES FOR WHITE PORTLAND CEMENT

Cast Concrete Units

For making cast concrete stone. For giving concrete blocks a white or exposed aggregate face. For making garden furniture. For making floor tile—Ask for circulars.

Pointing and Setting

For obtaining a white or colored joint with a mortar that will not stain the finest textured stone or tile. Specifications and instructions gladly furnished on request.

Waterproof Finishes

For lining swimming pools, dairies, steam or refrigerator rooms with a white waterproof coating (Used in connection with our Alkagel or GF 10 Waterproofing Paste).

Stucco

For use in the final coat where white or effects in color are desired. Write for stucco instructions and specifications and booklets: New Homes for Old, Guide to Good Stucco, Early Stucco Houses, Information for House Builders, etc.

CARNEY Cement

FOR BRICK & TILE MORTAR

Produces a bond that becomes harder than the brick it joins.

SIMPLE MIXING DIRECTIONS

Mix one part of CARNEY dry with four parts clean sharp sand, add water and use immediately.

Add water to left over mortar the following day and use it.

COLD WEATHER DIRECTIONS

Heat the sand and water and use as quickly as mixed.

FOR NON-POROUS AND HARD SHALE BRICK IN COLD WEATHER

For every five bags of CARNEY use one bag of Portland Cement. This quickens the set of the mortar, which is necessary when laying impervious brick in cold weather.

Carried in Duluth Stock in cloth sacks, 50 lbs. each, Price quoted on application.

In Carload Lots, Can furnish in either cloth or paper bags—Ask for delivered quotation.

For detailed information regarding the use of our White Portland or Carney Bricklayer Cement ask for special bulletins.



CONCRETE AGGREGATES

We are in position to furnish promptly from stock, clean, washed sand, gravel and crushed stone, either for truck delivery in Duluth and the immediate vicinity or in carload lots anywhere in Northern Wisconsin and Minnesota.

For brick laying, we offer a fine lake sand.

Ask for quotations either f. o. b. our dock, delivered to your job by our trucks or in carload lots. Will quote freight allowed to the railroad station nearest your work. We can serve you to advantage.

PLASTERING MATERIALS



A WORD ABOUT COVERING CAPACITIES

To the user of plaster in any form the value of the material properly chosen for the work proposed depends primarily on its covering capacity. By this is meant the ability of a material properly mixed and applied to cover yards of wall surface. Every plastering job presents different conditions. Wherever covering capacities are mentioned in connection with any material it is understood the figures given are for average conditions, to be used not as a basis for selling or ordering, but as an estimate only. The nature of the surface to be plastered, the thickness of the grounds, the type of wall desired, the character of finished surface required all enter into consideration when buying plastering materials.

The general lines and special products of leading manufacturers whose materials have been found by experience to be most suitable to the trade are suggested in brief outline as a preliminary to the presentation of complete information on request.

KINDS OF PLASTER

Gypsum Cement (Hard Wall) plasters.	Finishing Plasters (slow set) for gauging.
Wood Fiber Plasters.	Finishing plasters used without Lime.
Prepared Plasters (Sanded goods).	Keene's Cement.
Hydrated Finishing Lime.	Moulding and Casting Plasters
Plaster of Paris, (for Gauging).	Caen Stone.
Bond Plaster (for use upon concrete surfaces)	

GYPSUM CEMENT PLASTERS (Hard Wall Plaster)

Economical for scratch and brown coats where good sand is available. In general use for all kinds of plastering. Hair or other similar fiber is already mixed in making it ready for use with addition of sand and water.

Our Hard Wall and Wood Fiber Plasters (description below) come from the mills of the best and most reliable manufacturers in the Fort Dodge producing Center. Fort Dodge gypsum deposits are of exceptional purity and the product unexcelled for wall plaster manufacture. We usually have in stock several standard brands, such as Monarch, Plymouth, Kallolite, Acolite, Hardenell, Iowa, etc.

AVERAGE COVERING CAPACITY

Plastering Surface	Wood Lath	Metal Lath	$\frac{3}{8}$ inch Plaster Board, Insulite or Celotex	Brick & Clay Tile Walls	Gypsum Block
Grounds Covering Capacity in yards per ton	$\frac{3}{4}$ inch 180	$\frac{3}{4}$ inch 90	$\frac{7}{8}$ inch 210	$\frac{5}{8}$ inch 125	$\frac{1}{2}$ inch 175

WOOD FIBER PLASTER for Better Walls

For scratch and brown coats, particularly on wood lath or where good sand is not available.

Ready for use with addition of water only. Sand not to exceed one part on masonry walls may be used. Our Wood Fiber plasters are Fort Dodge quality products. Leading brands: Plymouth, Monarch, Kallolite, etc.

A Good Solution of the Sand Problem

Plasterers who wish to relieve themselves of all worry about sand can do so by using Wood Fiber Plaster, which is

mixed at the mill with fibered wood and requires only the addition of water at the job. This plaster is now used very extensively, and the demand is growing. The cost of plaster on the wall, according to many plasterers, is no greater than that of cement plaster, due to the time and labor saved in the mixing and application. The Wood Fiber Plaster wall is harder and denser; is more fire-resistive, as it is practically all Gypsum; and it is less brittle and can be sawed or nailed without its cracking. The convenience of Wood Fiber Plaster is even greater in winter when the sand is cold and wet.

AVERAGE COVERING CAPACITY

Plastering Surface	Wood Lath	Metal Lath	$\frac{3}{8}$ inch Plaster Board, Insulite or Celotex	Brick & Clay Tile Walls	Gypsum Block
Grounds Covering Capacity in yards per ton	$\frac{3}{4}$ inch 110 Unsanded	$\frac{3}{4}$ inch 75 Unsanded	$\frac{7}{8}$ inch 125 Unsanded	$\frac{5}{8}$ inch 90 1 part sand added	$\frac{1}{2}$ inch 110 1 part sand added

FINISHING PLASTER

BANNER FINISH NO. 1— A White no-lime finish Requires careful application. Sets hard and dense.

STYLE OF PACKAGES

Gypsum Cement Plaster (Hardwall) Wood Fiber Plaster & Finishing Plaster are packed in 100 lb. cloth bags or 80 lb. paper sacks. Duluth stock always carried in cloth, but paper packages can be furnished on short notice. Cloth sacks are charged for and are returnable for credit. These plasters can be shipped in mixed carloads with lime, plaster board, Rockbond (see pages 10 and 11) etc. Delivered prices on straight carload lots, mixed cars or smaller quantities gladly quoted on application.

Plastering Materials - Miscellaneous Gypsum Products & Lime

KEENE'S CEMENT

For Ornamental Plastering and Mouldings

A superior plaster for bathroom wainscots, kitchens, hospital rooms and wards, public buildings, etc. Slow setting with dense hard close grained surface. Can be scored in imitation tile effects. Usually gauged with lime putty.

Keene's Cement will bond perfectly with Concrete—Can be remixed as often as necessary, it positively will not "Kill".

Keene's Cement can be satisfactorily applied as a FINISH COAT over a base coat of Hard Wall plaster, although better results are obtained if both base and finish are KEENE'S CEMENT.

100 lb. sack KEENE'S Cement contains about 1½ cu. ft. Price on application.

CAEN STONE CEMENT

The name is derived from the fact that it seeks to imitate in color and texture the original French Caen Stone which comes only from Caen, the ancient capital of Lower Normandy. Used extensively in public buildings. 100 lb. sacks only—Price on application.

HYDRATED FINISHING LIME

To supply the local and North-West demand for the highest quality white Finishing Lime for putty coat work we offer a special Hydrate, produced locally from Selected Ohio stone.

"White Rock" Brand—comes in 50 lb. paper bags only—Price quoted on application. Can be shipped in mixed car with other limes and gypsum products described on this and previous page.

DENTAL PLASTER (Triple Fine Ground)

Used also by painters, Surgeons, in Orthopedic work, etc. For a number of years we have supplied the dental profession with a special grade of finely ground plaster paris which has been proven by dentists and dental laboratories in this section superior to anything previously available.

Western plasters, while made from an excellent gypsum and unexcelled for wall work fail to stand up under the exacting requirements of the modern dentist's laboratory. We ship our CASCADE BRAND, Triple Fine Dental Plaster in from the factory which supplies the New York, Philadelphia and Boston markets the bulk of their quality requirements.

We will gladly furnish any dentists not already acquainted with this brand a free sample for test in their own office. Since this material entered the Northwest Market every dental laboratory at the Head of the Lakes has standardized on same.

CASCADE BRAND, Triple Fine Dental Plaster comes in wood barrels, weight about 230 lbs. Quotation gladly furnished on request.

AGRICULTURAL GYPSUM (Land Plaster)

Agricultural gypsum (land plaster) is an untreated, ground, natural rock fertilizer, consisting mainly of hydrated calcium sulphate. It therefore bears two essential plant foods, calcium and sulphur.

Gypsum furnishes crops sulphur in an *immediately available* and *neutral* form—in exactly the form that sulphur is supplied to plants in nature.

It also increases greatly the nitrogen supply to crops.

Gypsum is an especially valuable crop food for legume crops:

alfalfa	vetch
clover	peanuts
beans	peas, etc.

Crops of the mustard family—mustard, cabbage, turnips, radishes, rape, etc.—use much sulphur and are much benefited by gypsum.

Gypsum preserves the nitrogen of manure.

HOARDS DAIRYMAN, *February 9, 1917, says:*

"We regard land plaster (agricultural gypsum) richly worth the price to use in the gutters and in the summer manure heap."

Agricultural Gypsum is carried in stock at all times. It comes packed in 100 lb. cloth bags. Can be shipped in mixed car with other plaster products, lime, plaster board, etc. Our 16 page booklet 'The How and Why of Agricultural Gypsum' will be gladly supplied to any interested person on request, together with delivered quotations on any quantity required.

LIME (For Brick & Masonry Work)

Common White Lump Lime—in barrels (180 lbs. net) or in bulk. Prompt shipment of best quality fresh burned white Lime from local kiln. Quotations on request.

Brown Lime (Lump) In headed barrels (180 lbs. net) or in bulk. Shipment on short notice from Southern Minnesota plant. Ask for delivered quotations.

Masons Hydrate—In 50 lb. paper bags only—not furnished in bulk. Many leading architects require the use of hydrated lime in concrete, brick mortar, etc. Can be stored for long periods without deterioration. Eliminates fire hazard. Can be shipped in mixed cars with plaster, plaster board, lump lime. Delivered quotations on request.

Bulletins: 'The Ideal Mortar', 'Modern Methods', 'Watertight Concrete', 'Hydrated Lime in Concrete Roads', etc., will be supplied to anyone interested.

LIME FERTILIZER

Under this head come two products—Air slaked lime and Ground Limestone—We are usually able to furnish either on short notice and solicit inquiries for carlots or any quantity which may be desired.

State and University Experiment Stations have shown that the regular use of lime increases crop yield.

Some reasons for this are as follows—Liming corrects sour soil. Helps to convert organic matter into plant food—improves the tillable qualities of the soil, especially clays as it tends toward flocculation of these soils—makes stored up plant food available. Additional information, prices, etc. furnished on request.

The Wall Mark
of Quality

ROCBOND
Exterior Stucco

Standardized -
Always Uniform

BUILD HOMES OF LASTING BEAUTY

Rocbond Stucco is a two-coat—all machine mixed—Magnesite product of rigidly standardized quality and uniformity.

Produced by one of the first manufacturers in the field—a concern that has grown until they today own and operate four modern plants. ROCBOND is the recognized leader in the magnesite stucco line and the standard by which other brands are judged.

Stucco as a building material is most ideal. Being plastic and pliable, numerous variations of line and surface—effects not obtainable with most other building materials, become available to the builder.

In surface treatments there is no



material so adaptable, smoothly troweled, spatter dashed or rough cast, stippled or treated in a score of ways this ancient and honorable, (albeit only recently come into its own) building product is ready to add beauty to your new home or when used 'to overcoat' an old, often ugly frame structure to substitute its own soft graceful line and beautiful textures and color effects for the harsh ungainly angles of many old buildings.

Rocbond Standardized Stucco recognizes no structural limitations. It may be applied over all approved building bases or combinations of bases. We will gladly furnish complete specifications.

"OVERCOATING" THE OLD HOMES - New homes for old

An important field in which Rocbond Stucco is unquestionably the leader lies in reclaiming old houses by the process which has come to be known by the descriptive term 'overcoating'.

In every community there are numerous old houses, standing in good and desirable locations, constructed from the best of materials, lumber that is probably better than the market affords today. The lines of these houses are often very good although usually in the old days more ornamental work was put on than would be used today, often porches are decidedly out of date and scroll work, brackets, etc., very much in evidence.

Overcoating houses of this kind, with usually a small amount of remodeling, often produces a value that is greater than that of a new house.

A house after overcoating will in many cases give the owner as many more years of service as was received from the first investment.



Remember also that the overcoating of Rocbond is fireproof, a feature well worth considering.



The cost of overcoating usually runs about the same as three or four paintings and eliminates this expense forever.

Houses overcoated with Rocbond, because of the fact that the Rocbond wall is air and water tight are necessarily warmer than before treating. We recommend wherever possible that when overcoating existing structures, the opportunity be taken to apply one of our board form insulations on the outside of the old wall before the lath and Rocbond are applied. Where this is done large savings of fuel and increased comfort are bound to result. See pages 70 to 77 for description of Insulation materials.

Very few homes built before 1911 to 1912 contain any really efficient insulating material in their outside walls and ceilings. When overcoating, a method of remedying this deficiency is easily available.

Application of ROCBOND -- The Standardized Stucco

General Rules:--Complete Specifications Gladly Furnished on Request

ROCBOND is applied in two coats. Each coat must be applied at least one quarter inch thick. The total thickness must never be less than one half inch. An even better job is insured by applying ROCBOND five eighths or even three quarters of an inch thick. While the tensile strength of ROCBOND is several times that of cement stucco it is important to guard against an all too-common practice of applying stucco too sparingly.

In a general way the mixing and application of ROCBOND differs little from the method used in applying other plastic materials. The setting is more easily controlled and the extreme fineness of the mix makes it very plastic and easy to work.

Dissolve Chloride in clean water (using metal stock tank or similar container) so that a solution of a gravity 22 degrees Baume is secured. If Chloride is furnished in solution, test with Baume scale hydrometer to see that gravity is 22 degrees. Agitate mixture before making tests. 22 degrees is the correct hydrometer reading for any temperature or weather variance. Do not allow solution to vary from this figure.

Any good competent plasterer can apply ROCBOND. We will gladly furnish any one interested complete specifications for mixing and applying.

Before commencing work see that all tools are clean. Before applying the first coat, brush the base well with the mixing liquid. (The brushing of the surface with the mixing liquid shown should precede the application of ROCBOND always, both on the base and on the first coat before the finish coat is applied.) The surface immediately preceding the ROCBOND application should be kept well brushed with the liquid. The first coat should be troweled very thoroughly so that all keys and voids are filled. Work the stucco well against or behind the door and window casings.

Work should be begun at the top and be carried down continuously without allowing the ROCBOND to dry at the edge. The finish coat may be applied any time after the first coat has set.

Warm weather hastens the set of ROCBOND, while cold weather retards it. ROCBOND is applied successfully Summer or Winter. A temperature of twenty degrees below zero has no effect on ROCBOND.

ROCBOND DRY ROCK DASHES

The finish coat of ROCBOND may be troweled, spatter dashed, stippled or finished in the same manner as ordinary cement stucco. The most beautiful effects and by far the most popular finish for ROCBOND is secured by the use of vari-colored crushed stones, pearl shell, quartz, art glass, etc. known to the trade as "dashes", the name being descriptive of the way in which these materials are "dashed" onto the surface of the stucco before it has set.

The application of these dashes is fully described in circulars we will gladly furnish on request.

We list below an excellent assortment of dashes which we aim to keep constantly in stock at our Duluth warehouses.

- | | |
|----------------------------|--------------------------------|
| No. 1—Blue - Black granite | No. 11—Buff Marbles |
| 2—Pink Granite | 12—Cream Pebbles |
| 3—Ruby Red | 13—Mica Grit (silver gray) |
| 4—Glass - Mixed Colors | 14—Dark Pebbles |
| 5—White Quartz | 15—Creme Green |
| 6—Mica Spar (bright gray) | 16—Royal Green |
| 7—Brown pebbles | 17—Pearl Shell, polished |
| 8—Jet Black | 18—Antique Green |
| 9—Dark Red Granite | 19—Pearl Shell, unpolished |
| 10—Gray Marble | 20—Special light Green (Glass) |

STYLE OF PACKAGES

ROCBOND, both first (scratch) coat and second (finish) coat is packed in heavy rope paper bags, for which there is no charge and which are not returnable.

DASHES are shipped in light weight burlap bags, for which there is a charge of 10c each, and which are returnable under the customary restrictions.

CHLORIDE for preparing mixing solution when for local

delivery is practically always furnished in solution form. When for freight shipment Chloride is furnished in flake form in sheet iron drums, for which containers no charge is made.

FREIGHT SHIPMENTS of ROCBOND moving either state or interstate require the heavy paper bags to be inclosed in a cloth or burlap bag. Otherwise freight rate is raised from fourth to second class. These bags are charged for and returnable same as dash bags.

MIXED CARLOADS

ROCBOND stucco can be shipped in mixed cars with plaster, lime cement, plaster board and we will gladly quote delivered prices on carloads mixed or straight. Write for quotations or for any literature or information desired.



American Steel & Wire Company's Reinforcement



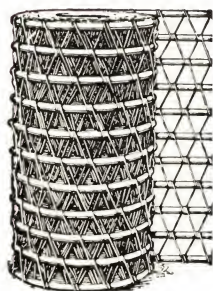
MILLER TRUNK ROAD NORTH OF DULUTH

curved but the wire fabric so held the concrete together that these fine fractures are invisible, as the photograph indicates.

American Steel & Wire Co., fence as guard rail on above road job. Ohio state Highway Department records indicate the maintenance cost on this type of road reinforced with Triangle Mesh will average \$40.36 per mile per year. Compare this with the maintenance cost of the road shown on opposite page.

The Reinforcement of Concrete with Steel

Both join into one solid, integral mass, the steel imparting its full strength throughout the concrete



TRIANGLE MESH
Wire Fabric Reinforcement

Such changes produce a pull that cannot be overcome by the concrete because of its comparatively low tensile strength.

Steel wire fabric, having high tensile strength, is therefore placed in the concrete to reduce to a minimum the liability to rupture in the pavement. The continual changing of the concrete slab causes openings unless they are held together by steel fabric.

Without the aid of the steel fabric, the slab is liable to rupture, and the opening widens. Traffic, striking such an opening, breaks away the brittle edges; moisture is allowed to enter and with the frost action the edges are further chipped and weakened. Temporary repair is made on the road by filling the openings with tar. This unsightly remedy must be applied very soon or it is of little avail. The original strain that ruptured the slab is still in force, ever widening and demanding the use of more tar. Serious damage to the road is the result.

By the addition of steel wire reinforcing fabric, the originally durable, slightly and sanitary surface of the concrete is kept intact. The additional satisfaction and service obtained from a road reinforced with steel wire fabric makes the extra expense a genuine economy.

Let us build steel wire mesh reinforced concrete highways that will stand the test of time under the increasingly heavy agricultural trucking. There is a limit to the endurance of concrete alone. It must be closely bound together with steel wire fabric to meet the requirements of today and the near future, that demand a smooth and permanent road to save the wear on costly machinery and reduce the cost of gas and oil.

Do Not be Misled by the Term "Reinforced Concrete"

A few strips of steel here and there will not do the work. A concrete reinforcement to be efficient, must bind together every portion of the slab similar to the action of the wire in wired glass. The closer the wire meshes, the stronger and more proof against cracks is the slab. If cracks occur, this binder then holds the slab together, allowing no spread.

Triangle Mesh Wire Fabric Reinforcement

Style No.	Number and Gauge of Wires Each Longitudinal	Longit. Sect. Areas Sq. In. per Ft. Width	Effective Sect. Areas Sq. In. per Ft. of Fabric		Approx. Wt. Lbs. per 100 Sq. Feet
			Trans.	Longit.	

Longitudinals Spaced 4 Inches, Cross Wires No. 14 Gauge, Spaced 4 Inches

032	1—No. 12 ga.	.026	.022	.032	22
040	1—No. 11 ga.	.034	.022	.040	25
049	1—No. 10 ga.	.043	.022	.049	28
058	1—No. 9 ga.	.052	.022	.058	32
068	1—No. 8 ga.	.062	.022	.068	35
080	1—No. 7 ga.	.074	.022	.080	40
093	1—No. 6 ga.	.087	.022	.093	45
107	1—No. 5 ga.	.101	.022	.107	50
126	1—No. 4 ga.	.120	.022	.126	57
146	1—No. 3 ga.	.140	.022	.146	65
153	1— $\frac{1}{2}$ inch	.147	.022	.153	68
168	1—No. 2 ga.	.162	.022	.168	74
180	2—No. 6 ga.	.174	.022	.180	78
208	2—No. 5 ga.	.202	.022	.208	89
245	2—No. 4 ga.	.239	.022	.245	103
267	3—No. 6 ga.	.261	.022	.267	111
287	3—No. 5 $\frac{1}{2}$ ga.	.281	.022	.287	119
309	3—No. 5 ga.	.303	.022	.309	128
336	3—No. 4 $\frac{1}{2}$ ga.	.330	.022	.336	138
365	3—No. 4 ga.	.359	.022	.365	149
395	3—No. 3 $\frac{1}{2}$ ga.	.389	.022	.395	160

Longitudinals Spaced 4 Inches, Cross Wires No. 14 Gauge, Spaced 8 Inches

036-P	1—No. 12 ga.	.026	.009	.036	17
044-P	1—No. 11 ga.	.034	.009	.044	20
053-P	1—No. 10 ga.	.043	.009	.053	24
062-P	1—No. 9 ga.	.052	.009	.062	27
072-P	1—No. 8 ga.	.062	.009	.072	31
084-P	1—No. 7 ga.	.074	.009	.084	35
097-P	1—No. 6 ga.	.087	.009	.097	40

Longitudinals Spaced 4 Inches, Cross Wires No. 12 $\frac{1}{2}$ Gauge, Spaced 8 Inches

041-R	1—No. 12 ga.	.026	.014	.041	21
049-R	1—No. 11 ga.	.034	.014	.049	24
058-R	1—No. 10 ga.	.043	.014	.058	28
067-R	1—No. 9 ga.	.052	.014	.067	31
077-R	1—No. 8 ga.	.062	.014	.077	35
089-R	1—No. 7 ga.	.074	.014	.089	40
102-R	1—No. 6 ga.	.087	.014	.102	44

Length of Rolls: 150 feet, 200 feet and 300 feet.

Widths: 16 inch, 20 inch, 24 inch, 28 inch, 32 inch, 36 inch, 40 inch, 44 inch, 48 inch, 52 inch and 56 inch.

Ultimate tensile strength 70,000 to 85,000 lbs. per square inch.

Material may be furnished either plain or galvanized. Unless otherwise specified shipment will be made of material not galvanized.

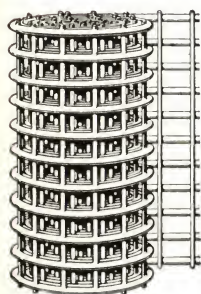
Heavier Mesh than shown above can be furnished, maximum $\frac{1}{2}$ -inch round solid longitudinal. Prices on request.

American Steel & Wire Company's Reinforcement

Concrete Roads Practically Put Every farm on a Railway. Build them as Enduring.

Typical Specifications for Pavement Reinforcing

Reinforcement



ELECTRIC WELD
Wire Mesh Reinforcement

The reinforcement shall consist of a steel wire fabric manufactured from cold drawn wire, finished members of which shall develop an ultimate tensile strength of at least 70,000 pounds per square inch and which shall bend cold 180 degrees around a pin the diameter of which is equal to the diameter of the wire specimens without cracking on the outside of the bent portion.

All reinforcement shall be free from excessive rust, scale, paint or coating of any character which will tend to prevent proper bonding of the concrete.

1. The fabric reinforcement shall weight not less than— pounds per 100 square feet. For figuring the weight per 100 square feet the width considered shall be the distance center to center of the outside or selvage longitudinal members.

2. The fabric reinforcement shall have a primary or longitudinal sectional area of at least — square inches per foot of fabric and a secondary or transverse sectional area of at least — square inches per foot of fabric.

(NOTE: As it is not necessary to specify both weight and areas, either No. 1 or No. 2 above should be eliminated.)

The main or heavier wires of the fabric shall be spaced not more than six inches apart. The secondary or lighter wires of the fabric shall be spaced not more than twelve inches apart.

Placing Reinforcement

The reinforcing fabric shall be placed not less than two (2) inches below the finished surface with the main or heavy wire running crosswise of the pavement. It shall extend to within two (2) inches of all joints and two (2) inches of the edges of the pavement. Adjacent widths of fabric shall be lapped two (2) inches. For figuring side lap of sheets no consideration shall be given to any projection or overhang of the cross wires outside of the longitudinals. Where more than a single length of fabric is required to extend across the pavement the end laps of these strips shall be at least twelve (12) inches.



THIS ROAD WAS NOT BOUND WITH STEEL.—This concrete road was carefully designed and constructed. Side ditch drainage, high grade cement, sand and stone, constant supervision and an experienced contractor were some of the details included. But the big mistake made was in trying to save about 6% or 7% by leaving out the wire fabric. As a result cracks formed and they will continually widen—there is nothing to hold them together.

The Ohio State Highway Department records indicate it will cost to maintain the above road an average of \$209.33 per mile per year. Compare this with the maintenance cost of the road illustrated on opposite page.

Electric Welded Fabric

Spacings of Wires in Inches		Gauge Number		Sect. Areas, Sq. In. per Ft.		Weight per 100 Square Feet
Longit.	Trans.	Longit.	Trans.	Longit.	Trans.	
2	16	2	8	.325	.015	119.4
2	16	3	8	.280	.015	103.6
(*) 2	16	4	9	.239	.013	88.5
(*) 2	16	5	10	.202	.011	74.6
(*) 2	16	6	10	.174	.011	64.7
3	16	2	8	.216	.015	82.6
(*) 3	16	3	8	.187	.015	72.0
(*) 3	16	4	9	.159	.013	61.4
(*) 3	16	5	10	.135	.011	51.8
(*) 3	16	6	10	.116	.011	45.1
(*) 4	16	3	8	.140	.015	56.1
(*) 4	16	4	9	.120	.013	47.9
(*) 4	16	5	10	.101	.011	40.4
(*) 4	16	6	10	.087	.011	35.2
(*) 4	16	7	11	.074	.009	29.7
4	12	8	12	.062	.009	25.5
4	12	9	12	.052	.009	21.8
4	12	10	12	.043	.009	18.6
4	12	12	12	.026	.009	12.6
4	12	5	5	.101	.034	48.4
4	12	6	6	.087	.029	41.6
4	12	7	7	.074	.025	35.4
4	12	8	8	.062	.021	29.6
6	12	0	6	.148	.029	65.3
6	12	3	3	.093	.047	51.2
6	12	4	4	.080	.040	43.8
6	12	5	5	.067	.034	37.0
6	12	6	6	.058	.029	31.8
6	12	7	7	.049	.025	27.0
6	8	12	12	.017	.013	11.1
6	6	4	4	.080	.080	57.8
6	6	5	5	.067	.067	48.8
(*) 6	6	6	6	.058	.058	42.0
6	6	7	7	.049	.049	35.7
(*) 6	6	8	8	.041	.041	29.9
(*) 6	6	10	10	.029	.029	20.7
4	4	4	4	.120	.120	85.3
(*) 4	4	6	6	.087	.087	61.9
(*) 4	4	8	8	.062	.062	44.1
(*) 2	2	10	10	.086	.086	60.3
(*) 2	2	12	12	.052	.052	36.8

(*) Styles usually carried in stock at Pittsburgh mill.

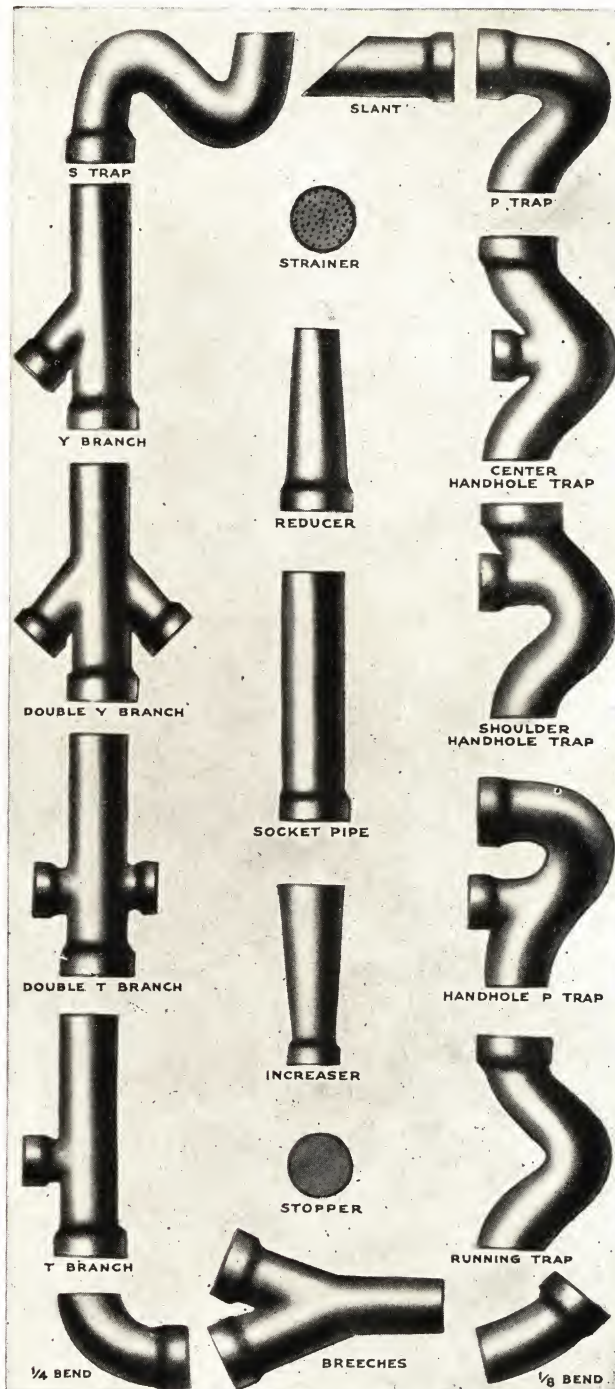
Finish: Plain or Galvanized.

Widths: Multiples of the spacing of longitudinal wire up to a maximum 60-inch for 2-inch spacing, 96-inch for 3-inch or 4-inch spacing, and 114-inch for 6-inch center of selvage longitudinals.

Rolls: Standard lengths 150 feet, 200 feet and 300 feet.

Tensile Strength: Standard 60,000 to 70,000 pounds per square inch, 70,000 to 80,000 pounds furnished when ordered.

SEWER PIPE



SPECIALS

Gutter, Split or Channel Pipe, per foot, 75% of one foot of sewer pipe, same size and thickness.
 Decreaser (socket on small end) same price as $\frac{1}{4}$ bends.
 Slants, same price as $\frac{1}{4}$ bends.
 *Double T and Y Branches, 2 feet long, same as 6 feet pipe.
 *Double T and Y Branches, 2½ feet long, same as 6½ feet pipe.

We have for many years distributed throughout Duluth, Northern Minnesota and Northern Wisconsin the products of the Red Wing Sewer Pipe Co. This sewer pipe is well and favorably known to engineers as the best pipe reaching this market.

TEST IT AS YOU LIKE.

Test it as you like. It rings like metal when you rap on it. Its glazed surface is smooth as glass itself. Nothing sticks to it, nothing harms it. Unless you go at it with a sledge-hammer it is indestructible. It is water-proof and rust-proof; proof against acids and alkalies, against frost and heat, against wear and weather. "It lasts forever."

Complete stocks of pipe up to 24-inch size are always carried in our Duluth Warehouses, together with a liberal assortment of fittings. Straight carload lots can be handled from Duluth stock or by shipment from factory. The plants being several days nearer this market than any other pipe factory, exceptional service can be given on Rush Orders of this nature.

WESTERN STANDARD PRICE LIST

Effective October 25, 1919

Discounts from the following list prices will be quoted on carload lots—delivered where and as required.

On less than carload lots net prices will be quoted on application.

3 AND 4 INCH		6 INCH	
Straight pipe, per foot	\$.25	Straight pipe, per foot	\$.35
$\frac{1}{4}$ bends and $\frac{1}{2}$ bends, each	1.00	$\frac{1}{4}$ bends and $\frac{1}{2}$ bends, each	1.40
Ys or Tees, 2 ft. long	1.00	Ys or Tees, 2 ft. long	1.40
Traps	2.50	Traps	3.50
Approx. weight, per foot, lbs.	10	Approx. weight per foot, lbs.	15

8 INCH		10 INCH	
Straight pipe, per foot	\$.50	Straight pipe, per foot	\$.70
$\frac{1}{4}$ bends and $\frac{1}{2}$ bends, each	2.00	$\frac{1}{4}$ bends and $\frac{1}{2}$ bends, each	2.80
Ys or Tees, 2 ft. long	2.00	Ys or Tees, 2 ft. long	2.80
Ys or Tees, 2½ ft. long	2.25	Ys or Tees, 2½ ft. long	3.15
Traps	6.00	Traps	8.40
Approx. weight per foot, lbs.	24	Approx. weight per foot, lbs.	32

12 INCH		Standard	Double Strength
Straight pipe, per foot		\$.90	\$1.00
$\frac{1}{4}$ bends and $\frac{1}{2}$ bends, each		3.60	4.00
Ys or Tees, 2 ft. long		3.60	4.00
Ys or Tees, 2½ ft. long		4.05	4.50
Traps		10.80	
Approximate weight per foot, lbs.		44	50

15 INCH		Standard	Double Strength
Straight pipe, per foot		\$1.30	\$1.50
$\frac{1}{4}$ bends, each		5.20	6.00
$\frac{1}{2}$ bends, each		10.40	12.00
*Ys or Tees, 2 feet long		5.20	6.00
*Ys or Tees, 2½ feet long		5.85	6.75
Approximate weight per foot, lbs.		60	72

18 INCH		Standard	Double Strength
Straight pipe, per foot		\$ 1.70	\$ 2.10
$\frac{1}{4}$ bends, each		6.80	8.40
$\frac{1}{2}$ bends, each		13.60	16.80
*Ys or Tees, 2 feet long		6.80	8.40
*Ys or Tees, 2½ feet long		7.65	9.45
Approximate weight per foot, lbs.		85	105

21 INCH		Standard	Double Strength
Straight pipe, per foot		\$ 2.30	\$ 2.80
$\frac{1}{4}$ bends, each		9.20	11.20
$\frac{1}{2}$ bends, each		18.40	22.40
*Ys or Tees, 2 feet long		9.20	11.20
*Ys or Tees, 2½ feet long		10.35	12.60
Approximate weight per foot, lbs.		115	140

24 INCH		Standard	Double Strength
Straight pipe, per foot		\$ 3.00	\$ 3.60
$\frac{1}{4}$ bends, each		12.00	14.40
$\frac{1}{2}$ bends, each		24.00	28.80
*Ys or Tees, 2 feet long		12.00	14.40
*Ys or Tees, 2½ feet long		13.50	16.20
Approximate weight per foot, lbs.		150	180

Attention is called to the elimination of the following diameters of Sewer Pipe—5", 7", 9", 14", 16", 20" and 22".

LIST PRICES ON LARGER DIAMETERS

	27"	30"	33"	36"	39"	42"
List price per ft. Straight Pipe	\$4.50	\$5.50	\$7.00	\$8.00	\$9.00	\$10.00
List price per ft. Double Strength	5.00	6.00	8.00	9.00	10.00	12.00
Discounts governing price 24" and smaller will not apply on 27" to 42".						

NET PRICES GLADLY QUOTED ON APPLICATION ON PIPE FITTINGS AND BRANCHES SIZES 27" TO 42".

*Branches with inlets (side opening) 15" and larger add 50% to list prices shown above.

DRAIN TILE



Can furnish drain tile in all sizes from 3 inch to 36 inch, inside diameter, and in either hard burned porous tile or vitrified as required.

Our Highway Grade passes County and State Specifications and has been used on many miles of Minnesota Highway Construction.

3 and 4 inch Vitrified furnished in hexagon pattern. Other sizes round as shown in cut.

Porous Tile			Vitrified Tile	
Size of Tile	Length In.	Approx. ship. wt. lbs. per foot	Length In.	Approx. ship. wt. lbs. per foot
3-in.	12	4½	12	4½
4-in.	12	6	12	6½
5-in.	12	8	12	9
6-in.	12	10	12	11
7-in.	12	12	12 & 24	15½
8-in.	12	15	12 & 24	18
9-in.	12	20	12 & 24	21½
10-in.	12	25	12 & 24	25
12-in.	12	32	24	33½
14-in.			24	45
15-in.			24	50
16-in.			24	55
18-in.			30	68
20-in.			30	82
22-in.			30	97
24-in.			30	110
26-in.			30	136
28-in.			30	164
30-in.			30	186
32-in.			30	212
34-in.			30	254
36-in.			30	311

Carload or less car lot prices gladly quoted on application.

Drain tile may be shipped in mixed cars with brick, hollow building tile, sewer pipe, flue lining and wall coping, etc.

WELL CURBING



Nothing so good and lasting for well curbing as vitrified sewer pipe. When put in with cement mortar at the joints it is absolutely water tight and keeps out all filth or surface water, and IT LASTS FOREVER.

When sizes larger than 24 inch are required we frequently furnish reinforced concrete pipe (see table of sizes at foot of this page).

GUTTER OR CHANNEL PIPE



Perfectly Smooth Channel

For any open drain, or to carry off the water from the eaves, our Gutter Pipe is the thing. Vitrified Gutter Pipe cannot rust or disintegrate and it gives a perfectly smooth channel for the water.

It is made in sizes 6 to 15-inch; other sizes can be made to order.

Price three-fourths that of ordinary Sewer Pipe.

STEAM & HOT WATER CONDUIT PIPE



Heat Proof

The central boiler plant, with conduits for steam or hot water, is a modern economy that would be more often employed but for the enormous loss of heat, especially in the northern climate.

All sorts of covering have been devised, but the Vitrified Steam Conduit is the most satisfactory and economical of them all. Made in two pieces, it is easily laid and fits in a perfectly tight joint. It lasts forever.

We invite correspondence from those interested in central supply plants.

Price one-half more than ordinary Sewer Pipe.

REINFORCED CONCRETE CULVERT PIPE

SIZE OF PIPE D	W	T	I	O	B	L	Δ MESH REINF NO		WEIGHT PER FT. LBS.
							HIGHWAY	RAILROAD	
12"	2"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	30x48	1-049	1-049	92
15"	2"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	30x48	1-049	1-049	111
18"	2 1/2"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	30x48	1-080	1-107	168
24"	3"	2 1/4"	1 1/4"	1 1/4"	1 1/4"	30x48	1-080	1-126	265
27"	3 1/2"	2 1/4"	1 1/4"	1 1/4"	1 1/4"	48"	1-107	1-126	321
30"	3 1/2"	3 1/4"	1 1/4"	1 1/4"	1 1/4"	30x48	1-146	1-146	385
36"	4"	3 1/2"	1 1/4"	1 1/4"	1 1/4"	48"	1-146	2-146	525
42"	4 1/2"	3 1/4"	1 1/4"	2 1/4"	1 1/4"	48"	1-245	2-168	685
48"	5"	4 1/4"	2 1/4"	2 1/4"	1 1/4"	48"	2-126	2-245	870
54"	5 1/2"	4 1/4"	2 1/4"	2 1/4"	1 1/4"	48"	2-146	2-245	1082
60"	6"	5 1/4"	2 1/4"	2 1/4"	1 1/4"	48x90	2-168	2-267	1294
72"	7"	6 1/4"	2 1/4"	3 1/4"	1 1/4"	90"	2-208	2-309	1814
84"	8"	7 1/4"	3 1/4"	3 1/4"	1 1/4"	90"	2-245	2-365	2511

Note: Under "REINF." No 1 Indicates One Ring } American Steel & Wire
No 2 " Two Ring } Triang. Mesh Reinforcing

Our "STANDARD" Reinforced Concrete Pipe is made in dimensions shown in table.

The ingredients used in its manufacture are tough durable 3/4" crushed trap rock, Lake Superior Coarse Sand and Universal Portland Cement in proportions 1 : 1 1/2 : 3.

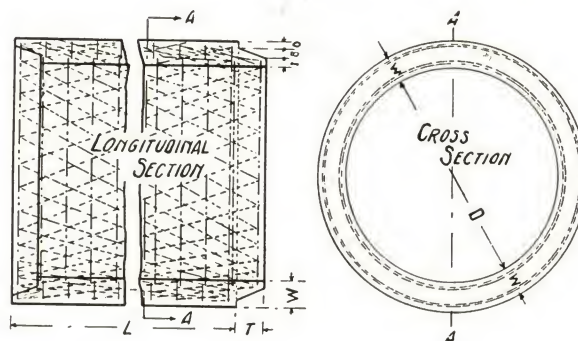
Extensively used for sewer construction Highway work and Railway culverts.

First cost is higher than on Corrugated Metal Culverts but once installed our Concrete Culverts require no replacement while inferior substitutes are good for only a few years at best.

Highway culverts can be laid in advance of the grading. The winter months particularly may be taken advantage of for the transporting and placing of this pipe when building of monolithic culverts in the field is impractical.

Immediate shipment on all sizes from Duluth Stock.

Ask for quotations on Carload or less than car lots—Quality considered our prices are the lowest—and exceptional delivery on any size requirements.



FIRE CLAY FLUE LINING



More fires result from defective chimney flues than from any other one cause. City ordinances of Duluth and most other cities require the use of flue lining.

OUR FLUE LININGS REDUCE YOUR INSURANCE

Sizes marked "*" carried in Stock at our Duluth Warehouses. Made in 2 ft. lengths only.

Standard Price List — Subject to Discount

SIZE Outside Dimensions	Approx. Wt. per foot	Price per foot
* 4½" x 8½"	14	.30
* 8½" x 8½"	20	.40
* 8½" x 13"	28	.60
* 8½" x 17½"	40	.80
* 13" x 13"	34	.75
* 13" x 17½"	44	1.00
* 17½" x 17½"	58	1.30
* 21" x 21"	78	2.00
24" x 24"	95	2.50

For Openings in Square Flues, add price of one foot for each opening.

All Flue Lining sizes are nominal outside dimensions, these and the shipping weights are necessarily subject to considerable variation due to the fact that some clays shrink much more than others in burning.

Flue lining can be shipped in mixed carloads with drain tile sewer pipe, wall coping, brick and hollow building tile. We will gladly quote delivered prices on straight or mixed carlots.

Flue linings increase the draft of the chimney by giving a perfectly smooth flue. They are safer, better and in the long run cheaper than a solid brick chimney.

A few words about Chimney Construction—

A chimney should always be started from the ground, and never from a bracket or shelf if there is any possible way of avoiding it. It should be of well burned clay brick or stone or when necessary to stucco, good hard burned clay tile may be used (see pages 18 to 21 of this catalog). Above the roof line if lime mortar is used it should have not less than one bag of cement added for each barrel of lime. The chimney should extend not less than two feet above the top of the roof if it goes through the center or peak of the roof and if it does not go through at the highest point or is on a flat or nearly flat roof, not less than three feet above the same. The top of the chimney should have a stone or cast cement cap or be topped off with one of our indestructible terra cotta tops.

All flues should be lined with fire clay flue linings. Not only does the flue lining add to the safety of the chimney construction by preventing fire reaching combustible parts of the structure through cracks which may develop in a chimney not so lined, but also prevents soot fires. The inside of the flue being perfectly smooth leaves no place for the soot to collect and for this reason chimney fires are almost unknown where flue lining is used.

Building Material Dealers and any other interested persons are invited to write for copy of 'An Ordinance for Construction of Chimneys' recommended by the National Board of Fire Underwriters.

Bricklayers and masons are almost universally anxious to use flue lining wherever specified. Its use enables them to save time as they do not have to plaster up the inside of the chimney with a mortar coat as they are obliged to when a single layer of brick is used.

Round Flue Lining

We can furnish round flues from six inch inside diameter up but inasmuch as probably 99 per cent of the chimneys built have rectangular flues, we do not carry large stocks of the round flue lining. We usually have in stock small amounts in six, eight, ten and twelve inch. We will gladly quote on your requirements and can usually give reasonably prompt shipment on same.

VITRIFIED SALT - GLAZED WALL COPING



Vitrified Wall Coping will permanently protect a brick wall against the ravages of time and weather. It gives the wall a finished appearance. Once applied it is everlasting.

It is cheaper to protect the top of your wall with well glazed vitrified coping than with metal that must be continually painted and replaced within a short span of years, or to top off with mortar that is certain to crumble to pieces in a short time.

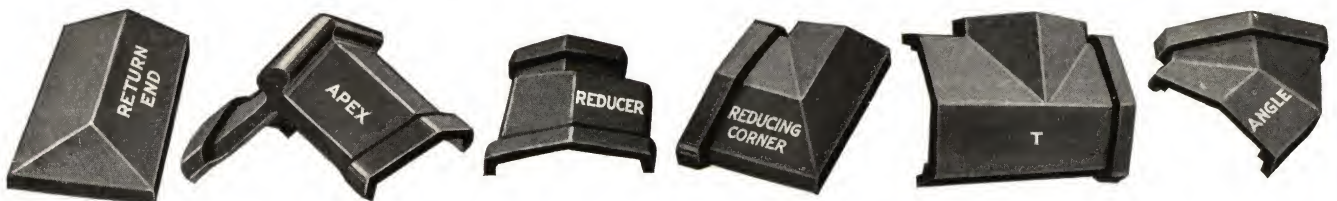
We are prepared to furnish Vitrified Coping in any desired quantity on short notice, guaranteeing quality equal to the best. Our wall coping can be shipped in mixed carloads with drain tile, sewer pipe, flue lining and brick. We will gladly quote delivered prices on straight or mixed carloads.

Illustrations show double slant coping—Single Slant Coping can be furnished for factory shipment only—Write us in regard to your requirements.

Wall Coping Corners: In ordering corners assume that you are standing in the angle formed by the corner. If the socket (large end) of the coping is to lie on the right you need a right hand corner, and vice versa.

Price List Subject to Discount

Wall Coping	For 8 inch Wall	For 12 inch Wall	For 16 inch Wall
Two Foot Lengths, Per Foot	\$.25	\$.35	\$.60
Corners, Ends or Starters, Ea.	1.00	1.40	2.40
Weight Per Foot	11 lbs.	16 lbs.	22 lbs.



CHIMNEY TOPS

Increase the draft - Improve the appearance of the Chimney

Our Chimney Tops—Numbers 1 to 7 inclusive are extensively used where for any reason it is desired to add to the height of an existing chimney.

Many chimneys having poor draft need only a little additional height to make them entirely satisfactory and the application of one of our standard tops is the most economical method of securing same. The cost of application is nominal, being only a small fraction of the cost of building a regular brick extension onto the chimney.

These tops are ornamental and often applied on new residence work on account of the improved appearance resulting.



No. 1

No. 2



No. 3

No. 4

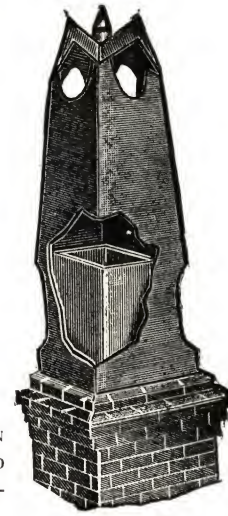


No. 5

No. 6

No. 8 and 8X Excelsior Patent Chimney Top

CUT-AWAY SECTION
SHOWING PATENTED
INNER FLUE CON-
STRUCTION.



No. 8

Our No. 8 top is the patent Excelsior Chimney Top, the best top manufactured. It will absolutely prevent the wind from blowing down any chimney where it is properly put on. It creates an upward draft when the wind blows. In other words, the stronger the wind the stronger the draft of the flue where an Excelsior top is used.

The base of the Excelsior is constructed with a double shell, with openings at the lower corners of the outer shell as shown in the above cut.

When the wind blows it passes in at the top, goes over the inner flue, does not and cannot go down the flue, but strikes the farther side of the outer shell, following that down and coming out at the openings in the lower corners of the farther side, causing a suction up the inside flue, down the outside shell and out at the lower corners.

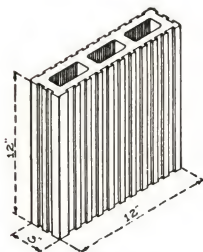
It is absolutely impossible for the wind to blow smoke or soot out through your stove or fire place if you have an Excelsior Top on your chimney.



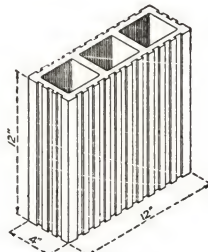
No. 7

Style No.	Name	Height	Size at Base	Price
1	Windguard	3 ft.	13 in. x 13 in.	Quoted on Application
2	Paneled	3 ft.	12 in. x 16 in.	
3	Hooded Windguard	3 ft.	13 in. x 13 in.	
4	Standard Round	2½ ft.	13 in. x 13 in.	
5	Standard Hexagonal	2½ ft.	13 in. x 13 in.	
6	Bonnet	2½ ft.	13 in. x 13 in.	
7-A	Cone	2 ft.	13 in. x 13 in.	
7-B	Cone	2 ft.	13 in. x 18 in.	
7-C	Cone	2 ft.	18 in. x 18 in.	
7-D	Cone	2 ft.	24 in. x 24 in.	
8	Excelsior Patent	3 ft.	13 in. x 13 in.	
8-X	Excelsior Patent	3 ft.	13 in. x 18 in.	

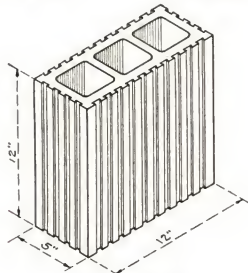
HOLLOW BUILDING TILE



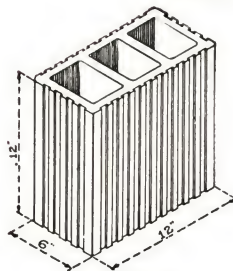
3 x 12 x 12
Weight, 14 lbs.



4 x 12 x 12
Weight, 16 lbs.

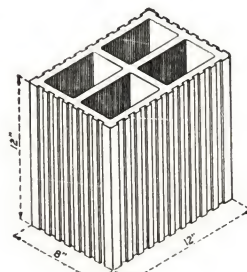


5 x 12 x 12
Weight, 18 lbs.

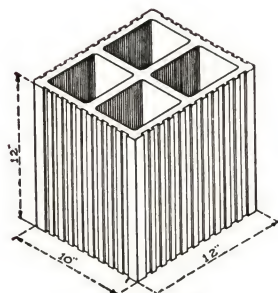


6 x 12 x 12
Weight, 20 lbs.

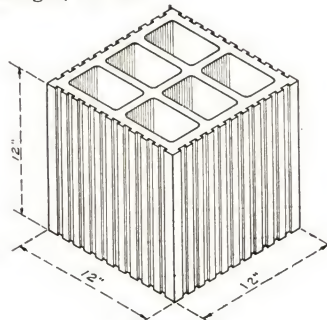
**STANDARD
PARTITION
and
STRUCTURAL
FLOOR TILE**



8 x 12 x 12
Weight, 25 lbs.



10 x 12 x 12
Weight, 29 lbs.



12 x 12 x 12
Weight, 40 lbs.

THE large units in which Hollow Building Tile are made, not only afford the simplest type of permanent construction, but permit of rapid building progress and considerable savings in both labor and mortar.

Our Hollow Tile is manufactured for us in one of the largest and most up to date plants serving this territory, that of the North Iowa Brick and Tile Company at Mason City, Iowa. Large production facilities, excellent railroad service and favorable freight rates to all of Minnesota, Northern Wisconsin, Michigan and the Dakotas, enable us to offer unexcelled service on this class of goods.

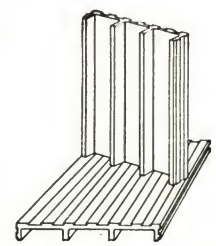
In the interest of economy of manufacture and avoidance of needless duplication of sizes, etc., the leading tile manufacturers have standardized on the sizes shown by the cuts shown on this and the following page, all of which are available for immediate shipment from factory stock, in addition to which a comprehensive stock, including most of these sizes, is also carried in our Duluth yards.

SPLIT FURRING TILE



Before Separation

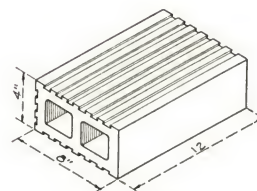
1 1/2 x 12 x 12
Weight
7 lbs.



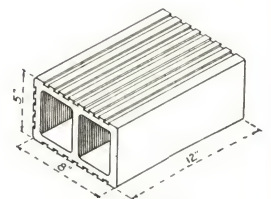
After Separation

2 x 12 x 12
Weight
8 lbs.

BACKUPS

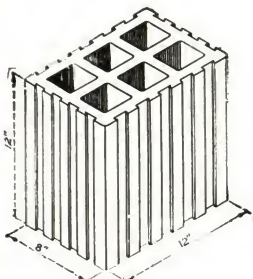


8 x 4 x 12
Weight 12 lbs.

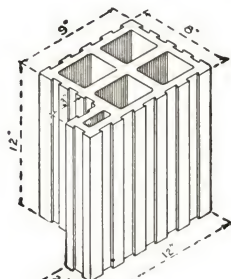


8 x 5 x 12
Weight, 15 lbs

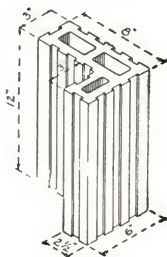
Standard Load Bearing Wall Tile



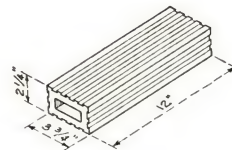
8 x 12 x 12
Weight, 36 lbs.
(Also in 28 lb. weight)



Jamb Tile

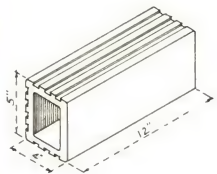


Half-Jamb Tile

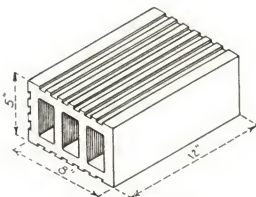


12" Hollow Brick
(For Bonding Face
Brick)
Weight, 4 lbs.

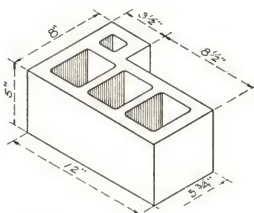
NOTE — For backing be-
hind Face brick in non-
load bearing walls 8", 12"
or 16" thick we recommend
4x12x12 3 Cell 16 lb. Tile
8x12x12 6 Cell 28 lb. Tile
12x12x12 6 Cell 40 lb. Tile



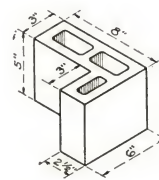
4 x 5 x 12
Weight, 8 lbs.



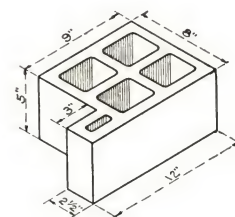
8 x 5 x 12
Weight, 16 lbs.



Special Corner Tile



Half-Jamb Tile



Jamb Tile

SPECIAL NOTES IN REGARD TO HOLLOW BUILDING TILE

Hollow Building Tile can be furnished promptly from stock in the sizes and weights shown on this and the preceding page. Additional sizes or varieties of scoring may be furnished on special order. On requirements of this nature we will gladly estimate time required for delivery.

The following features are worthy of note:

Standard Sizes: The sizes shown are actual and are those that have been adopted by National commercial and standards committees and approved by them as the most suitable and flexible for building construction. Being standard, they give to the purchaser all of the advantages of competition, both as to price and quality.

Standard Weights: The weights shown on the following page are accurate, and conform to the nationally accepted standards. Any lighter weights for load bearing tiles are generally unsafe, and heavier tile are wasteful of material and labor. High strength is insured by these weights.

Scoring: All blocks are furnished with the scoring as shown in the illustrations. You will notice that all sizes are scored with a deep dove-tail scoring that assures the greatest mechanical bond, and subsequent strength of construction.

Partition and Structural Tile: Particular care is taken to assure you of receiving straight and true blocks, burnt to the correct hardness with light color, and having the advantage of minimum weight, which however has not been reduced to where the tile are liable to excessive breakage in transit or handling.

With the purchase of any of these materials you are assured of an evenly graded and carefully handled product, well burnt, and of full size. We invite comparison of these products with any other make.

Engineering Service in connection with our Hollow Building Tile is furnished whenever desired.

Architects and Engineers are invited to write for Hollow Building Tile Association Pamphlet Serial No. 229 "Combination Hollow Tile and Concrete Floor and Roof Construction."

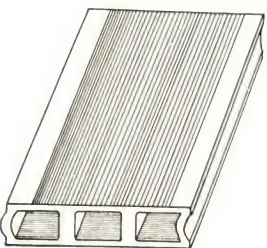
BOOK TILE

For Roof Construction

In using our Standard BOOK TILE in Fireproof Roof Construction the Tile are laid on TEE Irons spaced on 18 in. centers. The tile are cut slightly less than 18 in. long to fit this Spacing.

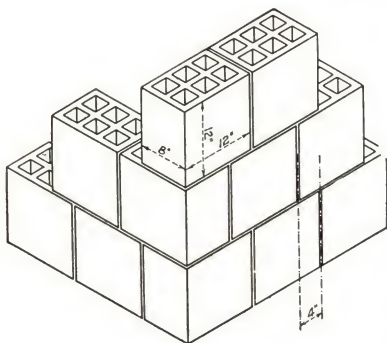
Can furnish book tile up to 24 in. long on Special Order. Time of delivery dependent upon plant conditions.

Whenever BOOK TILE or thin concrete roof slab construction is used, one or more layers of Celotex or INSULITE—Board form Insulating Materials which will be found fully described in pages 70 to 77 inclusive of this catalog — should be applied under the roofing to effectually prevent condensation and eliminate heat loss.



HOLLOW BUILDING TILE

Specifications for Hollow Building Tile for use in Exterior Walls



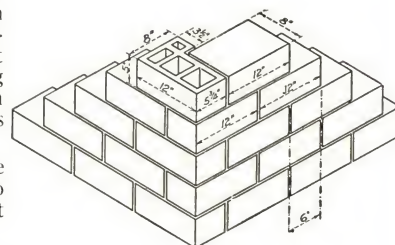
End Construction 8" Wall
The usual method of bonding corners when wall is to be stuccoed.

All Hollow Building Tile shall be an approved product bearing The Hollow Building Tile Association trade-mark MASTERTILE

Hollow Tile shall be uniform, straight, free from objectionable cracks and be manufactured in such a manner and burned to such a degree of hardness that it will have an average absorption of not over 12 per cent and develop an average crushing strength of not less than 700 pounds per square inch of gross area, when tested in the same position as when laid in the wall.

NOTE:—Exposed Wall Tile:—Smooth face tile or other tile for use in exterior walls without stucco finish should be specified to have an absorption of not over 10 per cent.

NOTE:—Foundation Tile:—Tile for use in foundation walls in saturated soil or where constantly subjected to sub-surface water and the action of frost should be specified to have an absorption of not over 8 per cent.



Corner bonds for 8" wall side construction using special corner tile.

MORTAR FOR LAYING Cement Mortar

Hollow Building Tile should be set with cement mortar composed by measure of one part Portland cement to not more than three parts clean sharp sand, to which may be added lime paste or hydrated lime not exceeding 15% by measure of the cement.

Note:—The percentage of lime added is always figured on the quantity of the cement used, therefore 15 per cent is equal to about one-sixth part by measure of the cement.

The lime specified is not needed to make the mortar stronger, but to make it more plastic and easier to handle. Mortar containing lime will adhere better to the tile, makes a neater job and results in a saving in labor. Too much lime must not be used as it weakens the mortar. A straight lime mortar, however rich the mixture, is not suitable for setting Hollow Tile.

A sand containing a quantity of loam must not be used for cement plastering or stucco.

By the courtesy of the Hollow Building Tile Association we show at the right their table of quantities of materials required to lay various sizes of Hollow Tile. All estimates are approximate. Any of the Hollow Building Tile Ass'n publications furnished on request.

CEMENT STUCCO ON HOLLOW TILE

Mortar for exterior cement stucco or cement plastering should first be mixed dry. Spread the sand in a layer about 4 inches thick and dump the quantity of cement required on top of the sand and thoroughly mix the two materials dry until a uniform color is obtained; then add two-thirds of the quantity of water required and again mix, adding water as required to any dry spots, to obtain a uniform mass of proper consistency. A slight excess quantity of water is better than too little; but too much will make the mortar thin and more difficult to handle and retard the setting somewhat, especially in damp or cold weather.

When dry hydrated lime is used in cement mortar it should be added with the cement and mixed in dry before water is added, but if plastic lime putty is used it should be worked into the cement mortar after the water has been added.

Hollow Tile walls should be thoroughly cleaned from dust, dirt and lime mortar, and thoroughly moistened with water.

Cement plastering should be kept moist and protected from the sun, wind and frost until it has thoroughly hardened.

TABLE OF QUANTITIES FOR CEMENT MORTAR

Materials required to lay up 1000 pieces of Hollow Tile

Table gives quantities of mortar materials required to lay up 1000 pieces of Hollow Tile (pieces not square feet) of the various sizes given. This table allows about 10 per cent for waste and is based on the mixture that is recommended for Hollow Tile construction, consisting of one part Portland cement and three parts sand, to which 15 per cent of the volume of cement of hydrated lime or lime putty is added.

For the convenience of builders the table gives the quantities of lime both by measure and weight for lump lime and by weight for hydrated lime.

Barrel of Cement Specified to be 3.8 cu. ft.

Size of Tile	Thickness of Wall	Approximate Quantity of Mortar, Cu. Ft.	Mortar Materials Required				15% These Quantities For Ordering Lump Lime in Lbs.
			Cement Sacks	Sand, Cu. Ft.	15% Dry Hydrated Lime, Lbs.	15% Lump Lime Paste, Cu. Ft.	
4x 5x12	4"	19.66	6.28	19.65	38	.94	28
5x 4x12	5"	23.12	7.36	23.11	44	1.10	33
5x 8x12	5"	28.91	9.24	28.89	55	1.38	42
8x 5x12	8"	39.33	12.66	39.31	75	1.88	56
4x 5x12	12"	59.02	18.88	59.02	113	2.83	85
8x 5x12	12"	59.02	18.88	59.02	113	2.83	85
4x12x12	4"	27.75	8.92	27.72	54	1.34	40
6x12x12	6"	41.66	13.32	41.66	80	1.99	60
8x12x12	8"	55.54	17.76	55.53	107	2.66	80
12x12x12	12"	83.33	26.64	83.32	160	3.99	120
					"A"	"B"	"C"

Use either one of Columns "A" and "B".

Column "A" is for dry hydrated lime purchased in bags.

Column "B" is for lump lime purchased by barrel or ton.

Column "C" gives the approximate quantity of lump required to make the amount of lime paste given in Column "B".

A barrel of lump lime containing approximately 3 cubic feet, weighing 185 pounds net, will produce about 6.5 cubic feet lime paste which, on account of water added will weigh about 70 pounds per cubic foot.

Thickness in Inches	1:1½		1:2		1:3	
	Cement, Sacks	Sand, Cu. yards	Cement, Sacks	Sand, Cu. yards	Cement, Sacks	Sand, Cu. yards
½	2.4	.14	2.0	.15	1.48	.17
¾	3.6	.20	2.96	.22	2.2	.25
1	4.8	.27	4.	.29	2.96	.33
1½	7.16	.40	5.92	.44	4.4	.49

A three gallon (12 quart) bucket holds about 40 pounds cement and about 16 pounds (dry) hydrated lime, or about 28 to 30 pounds of lump lime paste.

If sand is measured by wheelbarrows, the quantity of an average barrow load for the particular type of barrow used should be measured by making a box to hold exactly 1 cubic foot.



The above cut shows small but modern and fire safe country school built of one of our excellent rough texture face tile. First cost of this building little more than a frame structure—Our Variegated Tan and Brown Shades used in this building.

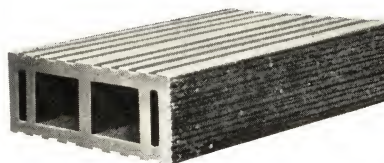
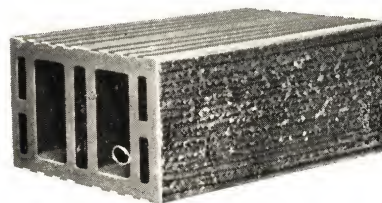
FACE TILE

Rough Faced Hollow Tile for Exposed Walls

We are prepared to furnish this material in various textures and ranges of colors including Reds, Browns, Tan & Gun Metal shades.

Well adapted for Residences, Small School Buildings, Factories, Filling Stations, etc.

The cut at right shows our standard 5x8x12" size. Illustration below is of our 3 1/4x8x12 size Corner tile and Specials furnished for each size.



These tile are extremely hard burned and will stand exposure in the severest climate. Deeply scored texture fits extremely well with the size of units furnished. We will gladly quote price delivered any freight station.

GYPSUM PARTITION TILE and WALL FURRING

SIZES and WEIGHTS

Size	Weight Per Sq. Ft.	Ceiling Height	Price
2x12x30 in. Solid	9.4 lbs.	10 ft.	Quoted
*3x12x30 in. Hollow	9.9 lbs.	13 ft.	
3x12x24 in. Solid	12.4 lbs.	15 ft.	
*4x12x30 in. Hollow	13.0 lbs.	17 ft.	Application
5x12x30 in. Hollow	15.6 lbs.	25 ft.	
6x12x30 in. Hollow	16.6 lbs.	28 ft.	
8x12x30 in. Hollow	22.4 lbs.	40 ft.	

*Carried in Stock at Duluth.

An extremely light, tough, underwriter approved fire-proof tile manufactured from highest quality Calcined Gypsum.

Our Gypsum Partition Tile, as will be noted from the accompanying table, comes in large size, light weight units, making the same a most economical material to handle.

The weight of Gypsum Tile is about 40 per cent less than that of clay tile, which affords an opportunity for savings in the supporting members of the building.

While extremely light the Gypsum Tile units are strong and very little breakage may be expected in handling. They can be cut with a saw to any length desired. This feature makes it possible to effect changes in partitions, or to locate new openings in Gypsum Tile partitions even after buildings are occupied at minimum cost and inconvenience to tenants.

Our Gypsum Tile should be laid up with mortar composed of our Standard Hard Wall Plaster—one part plaster to three parts by weight of clean dry sand, thoroughly mixed (do not use Portland Cement or lime mortar for Gypsum Tile).

Our Hollow Gypsum Tile are economical of plaster. Partitions require not over one half inch of plaster on each side to finish.

Our Gypsum tile is regularly furnished in thicknesses from 2 inch (solid) to 8 inch (hollow). The Split Furring Tile shown in the illustration above is to be sawed out from 3 inch or 4 inch Hollow Gypsum Partition Tile on the job by the contractor. Mills have discontinued these sizes in the Split tile.

Our Gypsum tile being thoroughly cured are shipped with low percentage of breakage, in this respect comparing favorably with well burned clay tile.

FACE BRICK

In our Warehouse Stocks at Duluth, it is our aim at all times to carry a representative assortment of Facing Brick suitable for every building purpose. This stock is available for immediate delivery by truck or for carlot shipments—When large jobs must be started immediately we can commence service from the warehouse completing with carloads direct from plants.

The following assortments are carried in stock at Duluth.

Rough Texture—(Vertical Scratch) Reds, Browns, Greens, Purples and Gun Metal Shades.

Matt Texture—Reds to Gun Metals.

Oak Barks—A distinctive texture, (Overlay resembles Oak Bark) comes in an extremely attractive Color Range (shale shades).

Rough Texture—(Vertical Scored) Buffs and Light Browns.

Smooth Pressed Brick—Buff and Gray.

Red Sand Mould Veneers

Salt Glazed Brick for Interiors and Exteriors—(See illustrations below).

Enameled Brick—See cuts on following pages.

Space available in this book is entirely insufficient to enable us to describe fully our complete face brick line.

Through connections with the largest, most reliable and best known manufacturers the operations of whose plants enable us to offer the best there is in facing brick from every section of the country we can supply any type, color or texture of brick known to the modern clayworkers' art.

Our Show Rooms, containing about 100 wall panels showing our various lines and assortments as they actually appear in the wall, is at the disposal of architects, owners and prospective users of face brick at all times. We will gladly show samples and furnish any desired information or suggestions, in regard to this important building material.

Architects and Engineers are requested to advise us when selections of face brick are to be made on any out of town jobs and our representative will attend with sample panels, prepared to quote delivered prices.



DOMESTIC SCIENCE

SALT GLAZED BRICK USED

PUBLIC SCHOOL NO. 5
INDIANAPOLIS

ROBERT FROST DAGGETT, ARCHITECT
INDIANAPOLIS

SALT GLAZED BRICK USED IN
CORRIDOR OF SAME BUILDING



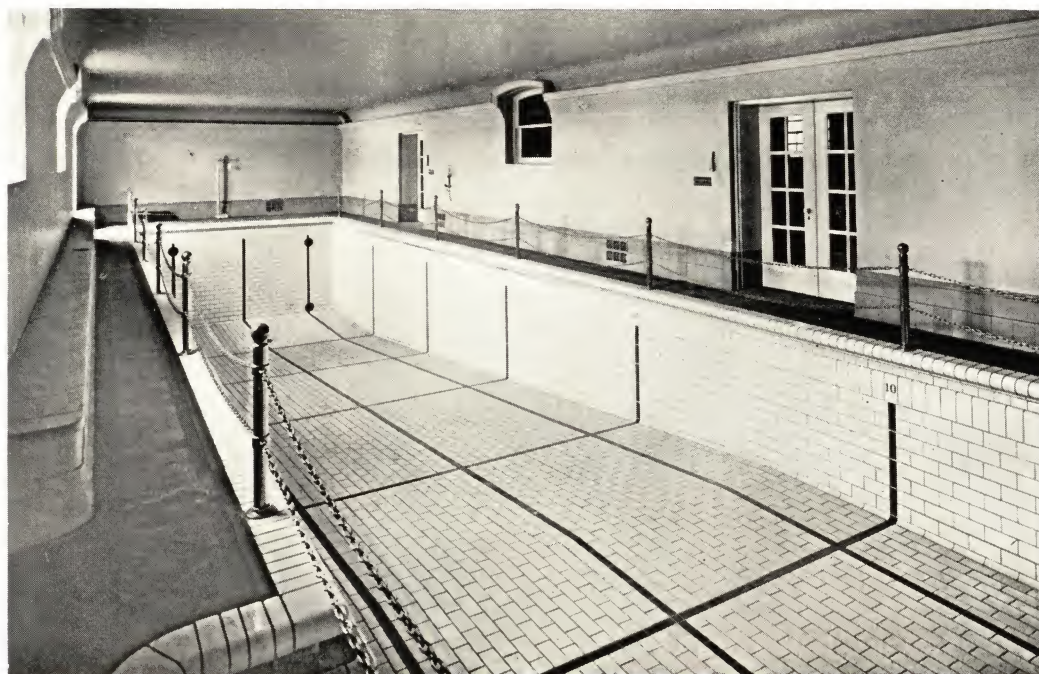
Salt Glazed Brick

The illustrations on the bottom of the preceding page show interiors in which our Hy-tex Salt Glazed Brick have been used.

Salt Glazed Brick are noted for their durability, cleanliness and beauty. Where interior sanitary conditions are the deciding factor, the most prominent architects are using them.

For work such as Domestic Science rooms, Gymnasiums, Toilet rooms, and corridors in school houses there is nothing anywhere near the price of salt glazed brick that can take their place. They are equally desirable for exterior walls, as they are proof against city smoke and dust and each rain renews a building constructed of our salt glazed brick to its original fresh appearance.

Enameled Brick



Our Hy-Namel Brick are unapproached in quality and durability by any similar brick of domestic or foreign manufacture. The manufacturers, the Hydraulic Press Brick Company, absolutely guarantee them not to craze, peel or discolor under severest climatic tests.

They are eminently suitable for fine fronts; various ornamental features, such as pilasters, panels, friezes, etc.; hotel corridors, courts, kitchens, markets, swimming pools, garages, dairies, hospital and school hallways, dressing rooms, etc.

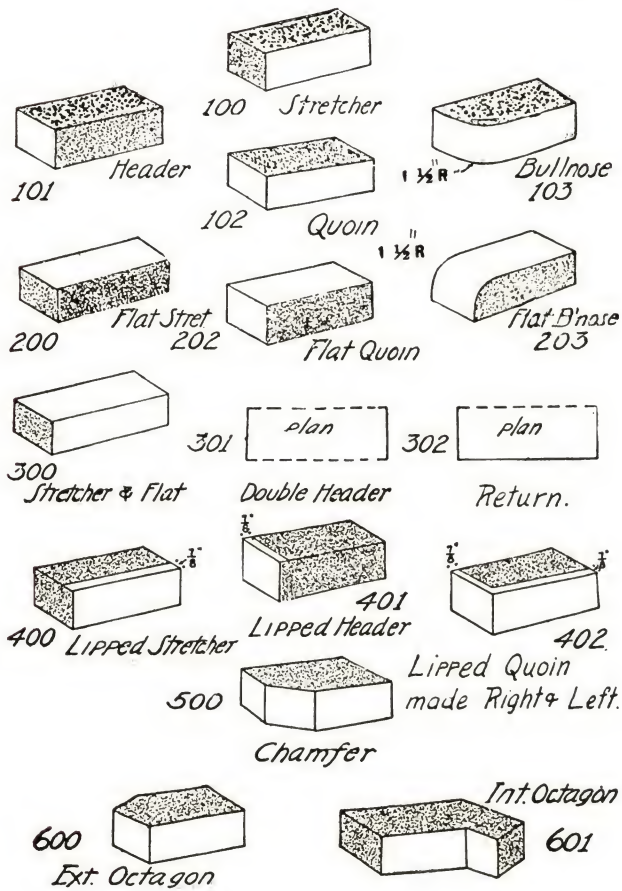
A few noted structures in which our Hy-Namels have been served are The Metropolitan Building and Shubert Theatre, St. Louis; Gruenwald Hotel, New Orleans, Custom House, San Francisco; Federal Prison, Atlanta; Cream of Wheat Building, Minneapolis; Westminster and Conway Buildings, Chicago; City Hall, Cleveland.

Hy-Namels are also furnished in second quality, suitable for Court Brick, at somewhat lower cost than the first quality Hy-Namels, but this quality furnishes an eminently satisfactory grade of brick for this purpose.

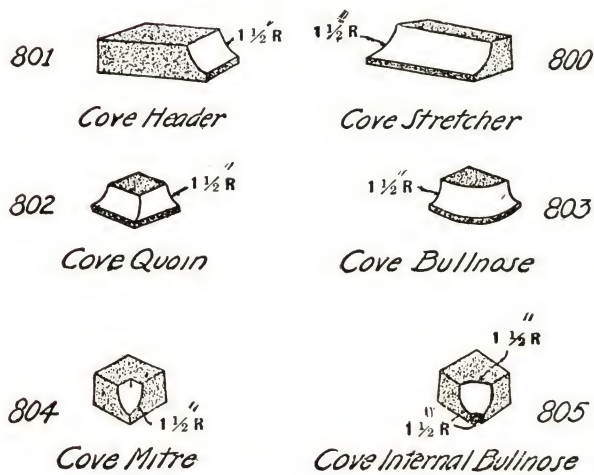
In our Hy-Namel class we are in position to furnish a Hy-tex Equitable Gray. These justly celebrated brick derive their name from the Equitable Building, New York City, in which 2,800,000 of these bricks were furnished. Their clean impervious surface and beauty of texture harmonize in color-tone with light granites, marbles and sandstones. We shall be glad to furnish complete information on these bricks on request.

The illustration above shows the Swimming Pool in the residence of J. A. Allison, Indianapolis, Ind. On the following page we illustrate the various standard sizes in which Hy-Namel Brick and Equitable bricks can be furnished. We have a complete catalog descriptive of these shapes. Also special shapes which can be furnished on special order. All of this literature will be gladly furnished architects and engineers on application.

Illustration of Types of Hy-Namel Brick

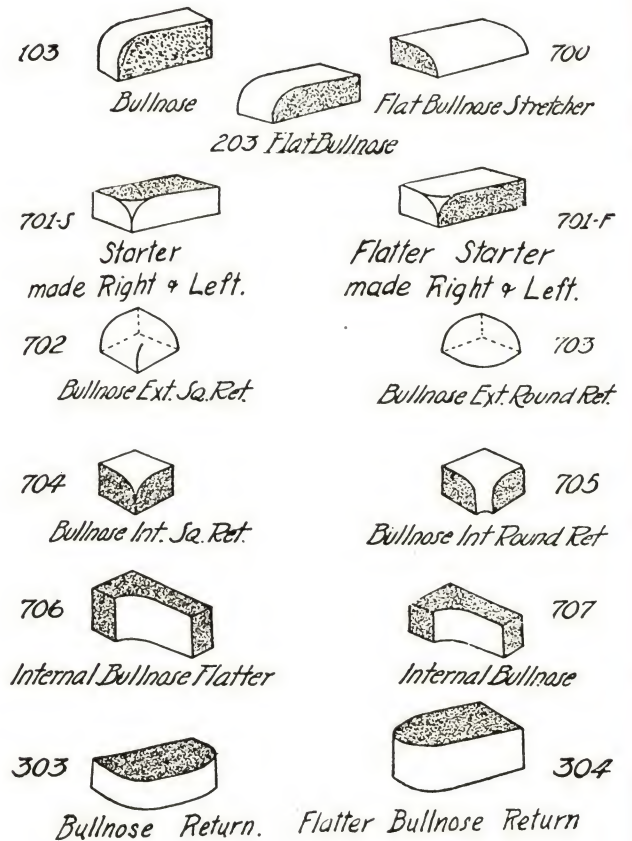


STANDARD TYPES

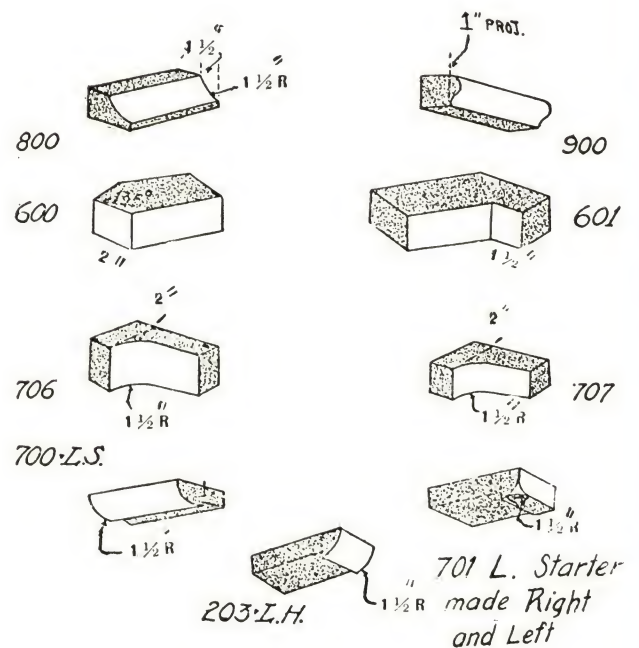


Cove only enameled unless otherwise specified

SANITARY COVE MOULD



BULLNOSE SPECIALS



PROJECTION OF SPECIAL SHAPES

Clinton Mortar Colors

Nature's Permanent Colors—Made Since 1887—at Clinton, N. Y.

THE mortar joint of a brick wall frequently represents nearly one-fourth of its entire area. Because of this its treatment, with respect both to color and texture, greatly influences the appearance of the fireplace, chimney, residence or building of which it forms a part. Even using the same brick, surprising differences in effect may be had simply by varying the color of the mortar. The extent to which this is true may be seen from a study of the buff brick panels reproduced on the following page.

Variety Available in Clinton Mortar Colors

Clinton Mortar Colors are made in a wide variety of shades from a rich mellow buff and the deepest red, through warm browns, olive green and chocolates to the blackest black. These colors used alone in varying quantities or mixed with one another, permit of almost any effect from pearl gray tones (produced by using a very little black), or warm aged tones (obtained by using a small amount of buff) to the most decided tones which may be secured by using these colors in the quantities here specified. The different colors in which Clinton Mortar Colors are supplied will be found listed on the following page.

Pulp or Dry Mortar Colors

Clinton Mortar Colors are sold either in pulp (sometimes called paste) or in dry form. Some brick masons think that pulp colors are more convenient to use and that they mix more readily with mortar. They are somewhat more expensive than dry colors and have less coloring power per unit of weight.

Permanent and Uniform

Clinton Mortar Colors are mineral colors, as permanent as the colors in natural rock. They are also absolutely uniform from shipment to shipment—kept so by rigid laboratory tests. Used by leading architects and contractors since 1887.

Selection of the Proper Color

In order to help in the selection of the proper mortar color we have devised the Clinton Mortar Color Experimenter. This consists of a number of strips of wall board $\frac{1}{2}$ in. thick, tinted along the edges to reproduce colored mortars. By using these strips, brick panels can be built up and studied with the various colored strips without the use of actual mortar.

Every dealer in Clinton Mortar Colors has a Mortar Color Experimenter for the convenience of his customers. We

will send an Experimenter upon request to any Architect who receives Sweet's Catalogue.

Test Panels—After using the Color Experimenter to determine what color is most effective with the brick selected, a panel should be set up with mortar mixed according to formula. Due to local variations in the color of sand and cement it may be found desirable to slightly change the amount of mortar color used.

Test panels should be allowed to stand for a few days before a final decision is made, to give the mortar an opportunity to dry out and attain its permanent color. The mortar when wet, is deeper in shade.



To be sure of a thoroughly dependable Mortar Color look for this yellow label, which appears upon all bags or barrels containing Clinton Mortar Colors.

should be backed with mortar so that drying may be from the surface which would be exposed in actual construction.

WARNING—Test panels should be of the same thickness as the finished wall and should be allowed to dry naturally as under actual working conditions. They



MORTAR COLORED WITH
CLINTON COLONIAL BUFF NO. 700



MORTAR COLORED WITH
CLINTON SPECIAL CHOCOLATE NO 404

Directions for Using Clinton Mortar Colors—*Continued***Directions for using Clinton Mortar Colors**

To get a mortar joint of intense color it is necessary to use approximately 100 lbs. of dry Mortar Color per 1000 brick laid in running or common bond with half-inch mortar joints. If mortar joints are wider or narrower, or if a bond requiring more or less mortar per 1000 brick is used, the amount of Mortar Color required per 1000 brick should be increased or decreased proportionately.

We give at right two formulas for colored mortar of deep intense color:

Cement Mortar

25 lbs.....	Clinton Mortar Color (dry)
1 bag (1 cu. ft.).....	Portland Cement
3 bags (3 cu. ft.).....	Sand
1/10 sack.....	Hydrated Lime

The above is sufficient to lay approximately 250 brick in running or common bond with half-inch mortar joints.

Cement Lime Mortar

30 lbs.....	Clinton Mortar Color (dry)
1 bucket (16 qts.).....	Portland Cement
1 bucket (16 qts.).....	Hydrated Lime
6 buckets (96 qts.).....	Sand

The above is sufficient to lay approximately 300 brick in running or common bond with half-inch mortar joints.

As it is not always convenient to weigh the color on the job, we tabulate below the various shades of Clinton Mortar Color, showing in separate columns the number of quarts of dry Clinton Mortar Color (**struck measure**) which are equivalent to 25 lbs. and 30 lbs.

CAUTION—This table applies only to genuine Clinton Mortar Colors.

* Colors marked thus carried in Duluth Stock	No. of No. of qts. qts. equiva- equiva- lent to lent to 25 lbs. 30 lbs.	
	25 lbs.	30 lbs.
* Clinton Hematite Red No. 10....	10	12
* Clinton Mortar Brown No. 400...	8½	10½
* Clinton D. S. Chocolate No. 402.	9	11
Clinton Special Chocolate No. 404	9	11
* Clinton Colonial Buff No. 700....	19	24
Clinton Pompeian Buff No. 600..	19	24
* Clinton Dark Buff No. 717.....	16½	20
* Clinton Mortar Black No. 900....	18½	22½
Clinton D. S. Black No. 800.....	19	24
Clinton D. S. Olive Green No. 1503	17½	21

Pearl Gray Mortar may be produced by using one-fourth as much Clinton Double Strength Black No. 800 as is recommended above to produce intense black mortar.

Clinton Mortar Black No. 900 or Single Strength Black, as it is sometimes called, will not give a jet black mortar. For best work use Clinton Double Strength Black No. 800.

If a clear buff mortar is desired a cement-lime mortar is recommended. Light colored cement and sand also tend to make the color of the mortar more brilliant. If a deep buff mortar is desired it will be obtained most readily by using a cement mortar with cement and sand of dark color.

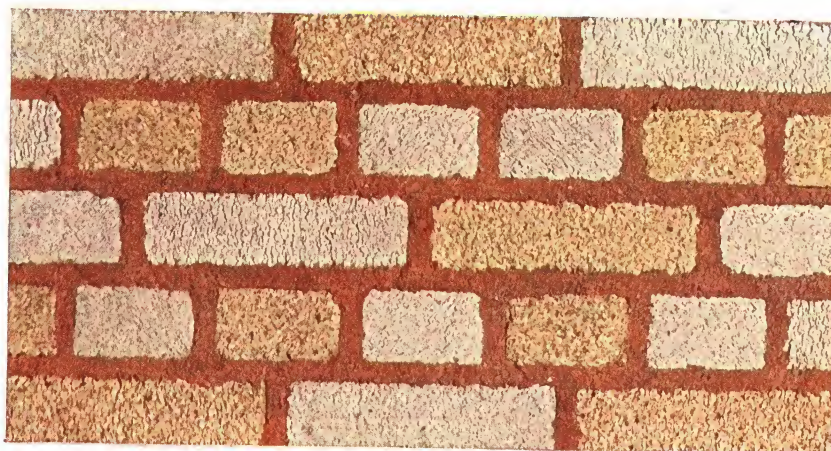
Many contractors get good results using smaller proportions of Clinton Mortar Color than those above recommended. This is possible if coarse sand is used and colors are mixed, remixed, then mixed again. Experience, however, proves that the amounts of color recommended will give good results under all conditions and we cannot assure satisfaction if less color is used. Money spent for a little extra color often more than pays for itself, in power and wages saved at the mixer and in the owner's satisfaction with the finished job.

How to be Sure of Good Results

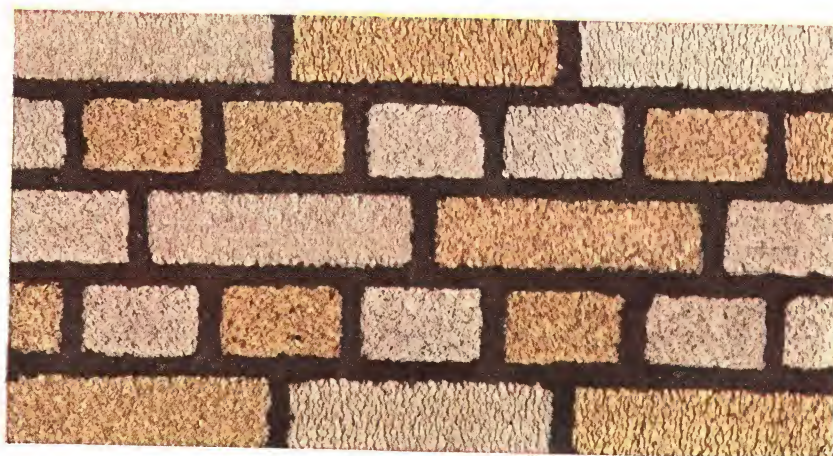
Mistaken attempts at economy and carelessness in the use of mortar colors sometimes cause dissatisfaction with the results. Such disappointments are wholly unnecessary and can be avoided if the formulas given are followed and these precautions are observed:



MORTAR COLORED WITH
CLINTON DOUBLE STRENGTH OLIVE GREEN NO. 1503



MORTAR COLORED WITH
CLINTON POMPEIAN BUFF NO. 600



MORTAR COLORED WITH
CLINTON DOUBLE STRENGTH CHOCOLATE NO. 402

Directions for Using Clinton Mortar Colors—*Continued*

1. Choose a **dependable brand**—one you know is uniform, permanent and of strong coloring power. Insist upon it. Don't accept a substitute. Be sure it is delivered in the original bags or barrels on the job.

2. **Make up test panels before you start the job.** Make them as thick as the finished wall and back them with mortar so that drying will be under normal building conditions. Let dry thoroughly before deciding on the color. Mortar dries out lighter than it appears when wet.

3. **Don't change mortar color brands in the middle of a job.** Some brands are weaker than others and of different color tone.

4. **Don't, in the middle of a job, change the kinds of lime, sand or cement used,** especially if the mortar is light in color; either gray or buff.

5. Measure or weigh mortar material according to directions. Don't guess.

6. **Mix the materials thoroughly.** It is best to mix the dry color, sand, hydrated lime and cement before the water is added, and after the water has been added mixing should continue until the mass is absolutely free from spots or streaks of color. Mixing can hardly be overdone.

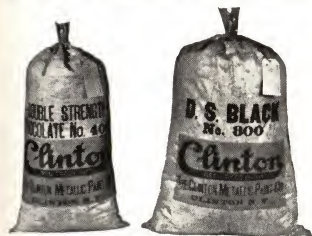
7. If lump lime is used in place of hydrated lime it **must** be thoroughly slaked and allowed to cool at least 24 hours before being brought into contact with the Mortar Color. Hot lime fades color.

8. Use mortar as stiff as practical. Don't use "sloppy" mortar. Keep batches as nearly as possible at the same consistency throughout the job.

9. When laying brick with a ½-inch joint, don't use amount of color recommended for a ¼-inch joint or vice versa. Occasionally we find masons still using for a ½-inch joint (which requires twice as much mortar) only 50 pounds of color per 1000 brick because that is the amount they used when the ¼-inch joint was in common use.

10. Because a certain number of quarts of one color in a batch of mortar has given good results, don't use the same number of quarts of another color and expect good results.

Bulk and coloring power are not the same for different colors, as will be seen from the table on opposite page. The sack of Clinton Double Strength Chocolate No. 402 shown herewith is, for example, about half the size of the sack of Clinton Double Strength Black No. 800; yet each weighs the same and each will color an equal quantity of mortar. In coloring mortar follow the exact directions for the specific color wanted and all difficulties will be avoided.



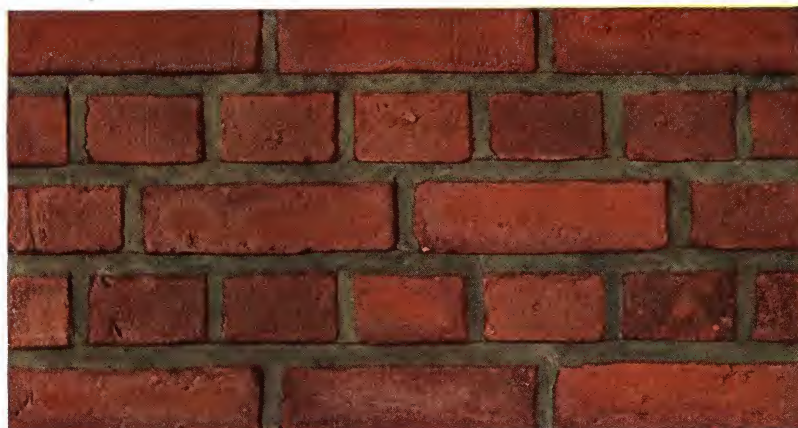
11. If joints are to be raked, **defer raking until mortar has begun to set.** This, together with working mortar as dry as possible, will help to prevent efflorescence—the appearance of a white scum upon the mortar.

12. If you do have efflorescence don't worry, and don't blame the mortar color. It is caused by water soluble salts in the cement, lime, sand or water that are brought to the surface by the water and left there when the mortar dries. It is just as common on plain mortar joints as on colored joints, though it is not always so clearly visible. Clinton Mortar Colors absolutely do not cause efflorescence, being entirely free from water soluble salts.

When mortar is used as dry as possible these salts do not come to the surface nearly as much as when a "sloppy" mortar is used. When joints are raked after the mortar has begun to set this efflorescence or scum is removed and usually does not reappear.

In almost every case the action of rain will in time remove efflorescence. If, however, it is desired to remove it at once a solution of one part of muriatic acid to not less than 20 parts of water will take it off. After washing the wall with this solution be sure and wash it down again with water or the efflorescence will again appear.

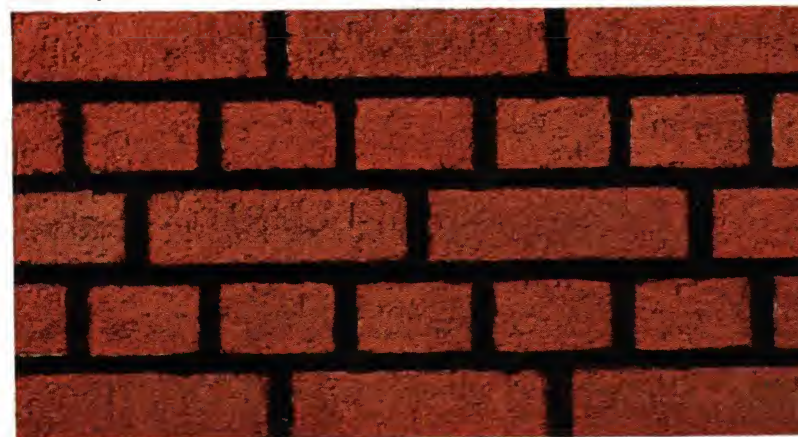
REMEMBER: The man who measures and who mixes the mortar holds one of the most responsible positions on the job. Make him realize this responsibility and it will save a world of trouble and help to insure satisfactory results.



MORTAR COLORED WITH
CLINTON DOUBLE STRENGTH OLIVE GREEN NO. 1503



MORTAR COLORED WITH
CLINTON DOUBLE STRENGTH BLACK NO. 800
Pearl Gray effect obtained by using ¼ as much color as given in Table for intense black



MORTAR COLORED WITH
CLINTON DOUBLE STRENGTH BLACK NO. 800
Full strength is recommended for mortar of intense black color

Directions for Using Clinton Mortar Colors—Continued**Coloring of Stucco**

The fact that stucco may be tinted has added much to its popularity as a facing material. By the use of Clinton Colonial Buff Mortar Color No. 700 it is possible to color stucco any desired shade between a rich light cream and a deep buff.

Coloring of rough cast stucco is recommended without qualification. The color lends a rich warmth that ordinary gray stucco does not possess. Its use offers no difficulties and brings no disappointments if specifications are followed with care.

In smooth finished stucco the color follows the trowel or float, giving a surface of somewhat irregular or mottled appearance. Many architects consider that this increases the interest of the finished wall and improves the effect. But those whose minds are fixed upon a wall with unbroken uniformity are advised before using it to study the effects that color gives in smooth finished stucco.

To get a rich, cream colored stucco, use:

Formula No. 1

White Cement	8 parts.16 quarts (1 bucket)
Sand	8 parts.16 quarts (1 bucket)
Lime Putty	1 part.. 2 quarts
Clinton Colonial Buff No. 700.1	part.. 2 quarts (struck measure) or about 2.6 lbs.

Many masons prefer the following formula, which makes use of a larger proportion of sand and is, therefore, less expensive.

Formula No. 2

White Cement	8 parts.16 quarts (1 bucket)
Sand	16 parts.32 quarts (2 buckets)
Clinton Colonial Buff No. 700.1½	parts.3 quarts (struck measure) or about 3.9 lbs.

To get a deep buff stucco, double the amount of color used in both cases.

The amounts in quarts and pounds given in formula 1 are sufficient to cover 100 square feet with a finish coat. Formula 2 will make sufficient stucco to cover 150 square feet with a finish coat. First coats need not contain color. The color to cover such a surface costs only 10 or 15 cents, which shows how little color adds to cost, compared to the extent to which it adds to beauty.

To produce a surface of clear attractive color, it is necessary to use white Portland cement.

Clinton Mortar Colors are carried in Duluth Stock in paper lined wood barrels, weights as follows—Red and Brown 500 lbs. D. S. Chocolate 475 lbs, Buff and Black 300 lbs. Open stock—Any quantity can be furnished—Less than full barrels usually shipped in non-returnable cloth sacks. Quotations on request.



MORTAR COLORED WITH
CLINTON DOUBLE STRENGTH BLACK NO 800



MORTAR COLORED WITH
CLINTON DOUBLE STRENGTH CHOCOLATE NO. 402



MORTAR COLORED WITH
CLINTON POMPEIIAN BUFF NO. 600



MORTAR COLORED WITH
CLINTON COLONIAL BUFF NO. 700

Clinton Mortar Colors, known all over the United States as the strongest, most uniform coloring on the market are made by **The Clinton Metallic Paint Company, Clinton, N. Y.** and have been distributed by us in Minnesota, Northern Wisconsin and the Dakotas. Due to carload shipment at favorable Lake and Rail Rates the cost is usually no higher than quoted on less reliable brands. We will gladly quote delivered Prices. Color card and Samples on request.



Hi-Frax Cement

(HIGHLY REFRACTORY)

Fire Brick Cement & Plastic Fire Brick



**MAKES FIRE BRICK JOINTS AS PERMANENT
AS REFRACTORY AND AS STRONG AS THE
BEST FIRE BRICK**



In use, Hi-Frax Cement, Hi-Frax Patch, and Hi-Frax Baffle are time and labor savors. All are in dry form, packed in 100 pound bags, and may be stored indefinitely without deterioration.

HI-FRAX CEMENT—sacks stamped in red and carrying a red tag with complete instructions for use—makes joints as highly refractory (3250+ degrees Fahr.) as the best Fire Brick.

You know how fire clay—because of its shrinkage when exposed to heat—crumbles and falls out.

You know that unless the mortar is as heat resisting as the brick, the joint burns out first.

Brick-to-Brick Hi-Frax Joints allow the fire-brick to do what they were made to do—give 100% service. By using high grade fire brick properly burned by the manufacturer and bonded in place with High-Frax Cement you get a monolithic wall that will outlast any other form of refractory.

Hi-Frax Patch

(HIGHLY REFRACTORY)

**THE SACK
WITH THE
BLUE TAG**

For use where it is hard to lay Fire Brick because of excessive cutting or for emergency repair work.

This is an ideal plastic refractory material that can be pounded into any desired shape. 100 pounds make 1 cubic foot.

Where brick have dropped out or holes opened, Hi-Frax Patch is packed in like mud and allowed to set at ordinary temperatures.

It is adapted for all kinds of fire-brick repair work where the heat does not exceed 2600 degrees Fahr.

A sack of Hi-Frax Patch should be kept in the boiler-room at all times for emergency repair work by engineers or firemen.

A High-Frax Patch, in time, postpones many costly shut-downs.

Hi-Frax Baffle

(HIGHLY REFRACTORY)

**THE SACK
WITH THE
GREEN TAG**

A monolithic gas-tight baffle which can be built into water-tube boilers at any desired angle—made by mixing Hi-Frax Baffle with water to the consistency of thick mud and pouring between the tubes, using a lattice framework.

To Architects and Engineers

A suggested specification

"All fire brick to be laid with a thin mortar of Hi-Frax Cement, as manufactured by Smith-Beal Fire Brick Company, and tapped in place with hammer to make "brick-to-brick" joints. Either dip the brick in the mortar or pour on the brick course. Spread the mortar over the face of joints exposed to the fire, making T-joints, and finish with a thin wash over all exposed surfaces".

This produces a highly resistant, monolithic wall, with ability to stand higher temperatures for longer duration, and to materially increase the efficiency of the fire wall, as well as its durability.

A Point Worth Thinking About

HIGHLY competitive methods of letting fire brick setting contracts often work to the disadvantage of the owner. Contractors are eager to use Hi-Frax Cement where its use is specified, and where all competitive contractors are figuring on the same basis.

The higher first cost of Hi-Frax Cement becomes by far the lowest last cost, and the saving in shut-downs, repairs, and the higher furnace efficiency makes Hi-Frax the truly economical mortar.

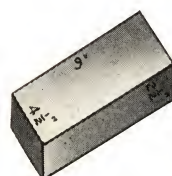
Specify Hi-Frax, and your contractors will gladly figure it. You will profit in the long run.



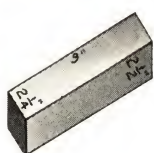
For Laying Fire Brick—Hi-Frax Cement is used just like ordinary fire clay—it is finer and easier to use. Mix with water to make a thin "Soup." Dip the brick in it or pour the mortar on the brick course, like the mason is doing in the above snapshot, rub to make a "brick-to-brick" joint and tap in place. The joint will outlast the brick.

FIRE BRICK

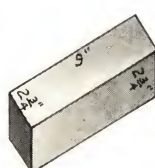
Standard 9" and 9" Series Fire Brick Shapes (Shapes marked "*" carried in Duluth Stock)



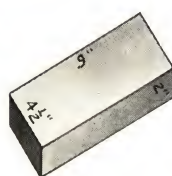
* 9" Straight
9" x 4 1/2" x 2 1/2"



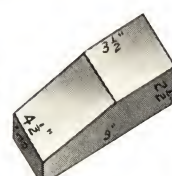
* Soap
9" x 2 1/4" x 2 1/2"



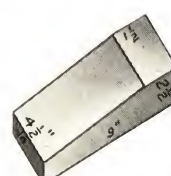
Checker
9" x 2 3/4" x 2 3/4"



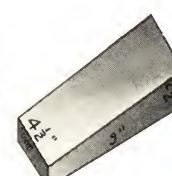
2" Brick
9" x 4 1/2" x 2"



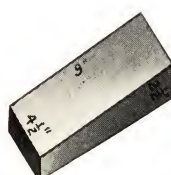
No. 1 Neck
9" x 4 1/2" x 3 1/2"
x 2 1/2" x 5/8"



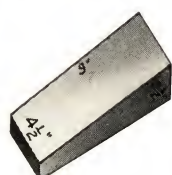
No. 2 Neck
9" x 4 1/2" x 2 1/2"
x 1 1/2" x 5/8"



No. 3 Neck
9" x 4 1/2" x
(2 1/2" — 5/8")



* No. 1 Wedge
9" x 4 1/2" x
(2 1/2" — 1 7/8")



* No. 2 Wedge
9" x 4 1/2" x
(2 1/2" — 1 3/8")



24" Circle Brick
24" Inside. 33"
Outside Diameter
12 to a Circle
(9" —) x 4 1/2"
x 2 1/2"



36" Circle Brick
36" Inside. 45"
Outside Diameter
15 to a Circle
(9" —) x 4 1/2"
x 2 1/2"



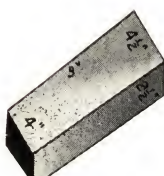
48" Circle Brick
48" Inside. 57"
Outside Diameter
20 to a Circle
(9" —) x 4 1/2"
x 2 1/2"



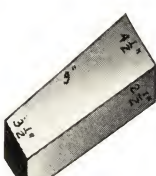
60" Circle Brick
60" Inside. 69"
Outside Diameter
25 to a Circle
(9" —) x 4 1/2"
x 2 1/2"



72" Circle Brick
72" Inside. 81"
Outside Diameter
28 to a Circle
(9" —) x 4 1/2"
x 2 1/2"



No. 1 Key
9" x (4 1/2" — 4")
x 2 1/2"



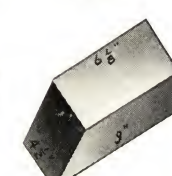
No. 2 Key
9" x (4 1/2" —
3 1/2") x 2 1/2"



No. 3 Key
9" x (4 1/2" —
3") x 2 1/2"



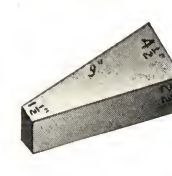
No. 4 Key
9" x (4 1/2" —
2 1/4") x 2 1/2"



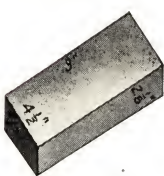
End Skew
(9" — 6 1/8") x
4 1/2" x 2 1/2"



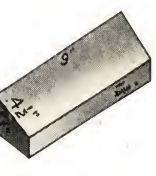
Side Skew
9" x (4 1/2" —
1 3/4") x 2 1/2"



Edge Skew
9" x (4 1/2" —
1 1/2") x 2 1/2"



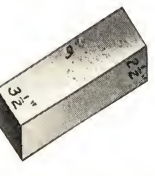
* No. 1 Arch
9" x 4 1/2" x
(2 1/2" — 2 1/8")



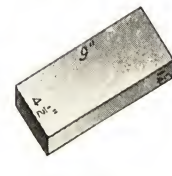
* No. 2 Arch
9" x 4 1/2" x
(2 1/2" — 1 3/4")



* No. 3 Arch
9" x 4 1/2" x
(2 1/2" — 1")



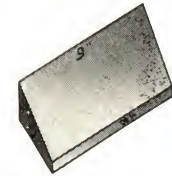
Small 9" Brick
9" x 3 1/2" x 2 1/2"



Split Brick
9" x 4 1/2" x 1 1/4"



Jamb Brick
9" x 4 1/2" x 2 1/2"



Feather Edge
9" x 4 1/2" x
(2 1/2" — 1 5/8")

- 76 No. 1 Arch Brick turn a circle 51 inches inside diameter.
38 No. 2 Arch Brick turn a circle 21 inches inside diameter.
91 No. 1 Wedge Brick turn a circle 54 inches inside diameter.
57 No. 2 Wedge Brick turn a circle 27 inches inside diameter.

- 113 No. 1 Key Brick turn a circle 12 ft. inside diameter.
57 No. 2 Key Brick turn a circle 5 ft. 3 in. inside diameter.
38 No. 3 Key Brick turn a circle 3 ft. inside diameter.
25 No. 4 Key Brick turn a circle 1 ft. 6 in. inside diameter.

Larger circles can be turned by using a proportion of square brick with the shapes.
Tables showing number of shapes and square brick for various circles will be furnished on request.

SQUARE EDGE TILE - For Baffles - Bake Oven Floors, Etc.

Two sizes only (2 x 12 x 12 and 2 x 12 x 18) carried in Stock. Can be furnished in a wide range of sizes for factory shipment.									
2 x 12 x 15	2 1/2 x 10 x 12	2 1/2 x 12 x 24	2 1/2 x 18 x 18	3 x 12 x 22	3 x 14 x 28	4 x 12 x 36	4 1/2 x 13 1/2 x 34	6 x 9 x 18	6 x 9 x 24
2 x 12 x 24	2 1/2 x 10 x 22	2 1/2 x 12 x 26	2 1/2 x 18 x 24	3 x 12 x 24	3 x 18 x 18	4 1/2 x 13 1/2 x 34	6 x 9 x 18	6 x 9 x 24	
2 1/2 x 8 x 22	2 1/2 x 10 x 24	2 1/2 x 12 x 28	3 x 6 x 24	3 x 12 x 28	4 x 9 x 32	6 x 9 x 18			
2 1/2 x 9 x 18	2 1/2 x 12 x 18	2 1/2 x 12 x 30	3 x 9 x 24	3 x 12 x 30	4 x 10 x 34	6 x 9 x 24			
2 1/2 x 9 x 20	2 1/2 x 12 x 20	2 1/2 x 12 x 36	3 x 12 x 18	3 x 12 x 36	4 x 12 x 18				
2 1/2 x 9 x 24	2 1/2 x 12 x 22	2 1/2 x 14 x 24	3 x 12 x 20	3 x 14 x 24	4 x 12 x 24				

REFRACTORY MATERIALS

We carry some of the most complete stocks west of Chicago of 9-inch Fire Brick, 9-inch shapes, Fire Clay Tile, Fire Clay and High Temperature Cement.

Space at our disposal here is too limited to describe fully the uses and particular application of our brands of Fire Brick. A few of the Standard Brands of Fire Brick we stock are mentioned below:

Hy-Brand St. Louis No. 1
Laclede St. Louis

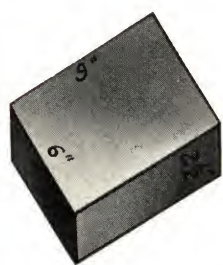
Laclede King

Hy-Brand FLINT
Laclede Crown

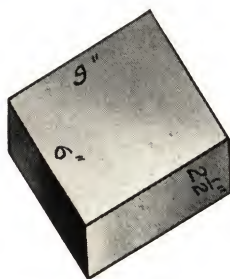
Full and complete information on any of these brands together with samples, test reports, and delivered prices gladly furnished on request. We are also prepared to quote on other grades of brick desired and invite your inquiries no matter what type of refractory material you use.

FIRE BRICK

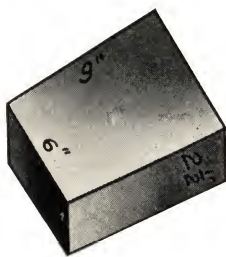
Representative Standard Shapes (Larger than 9 inch) adopted by The Refractories Manufacturers Assn.



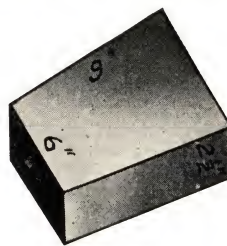
9" x 6" x 2 1/2" Straight
also 9" x 6" x 3"



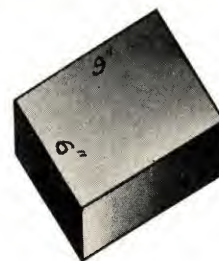
Large 9" x 6 3/4" x 2 1/2"



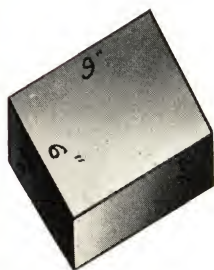
9" x 6" No. 1 Key
13" Circle inside diameter
91 Brick to the Circle
9" x (6"—5 3/8") x 2 1/2"
Also 9" x (6"—5 3/8") x 3"



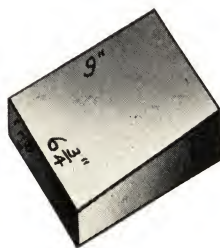
9" x 6" No. 2 Key
6" Circle inside diameter
47 Brick to the Circle
9" x (6"—4-13/16") x 2 1/2"
Also 9" x (6"—4-13/16") x 3"



Flat Back Straight
9" x 6" x 2 1/2"



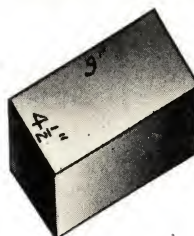
Flat Back Arch
9" x 6" x
(3 1/2"—2 1/2")



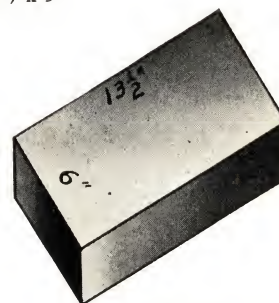
Large 9" No. 1
Wedge
9" x 6 3/4" x
(2 1/2"—1 7/8")



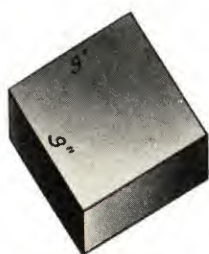
Large 9" No. 2
Wedge
9" x 6 3/4" x
(2 1/2"—1 1/2")



Open Hearth Checker
9" x 4 1/2" x 4 1/2"
10" x 4 1/2" x 4 1/2"
10 1/2" x 4 1/2" x 4 1/2"
10 3/4" x 4 1/2" x 4 1/2"
12" x 4 1/2" x 4 1/2"



13 1/2" Straight
13 1/2" x 6" x 2 1/2"
Also 13 1/2" x 6" x 3"



For Gas Flues
9" x 9" Straight
For Enlarging Circles
9" x 9" x 3 1/2"
Also 13 1/2" x 9" x 3 1/2"



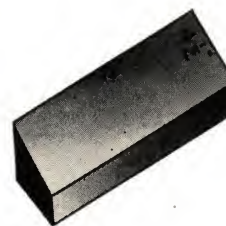
13 1/2" No. 1 Key
13 1/2" x (6"—5") x 2 1/2"
Also 13 1/2" x (6"—5")
x 3"



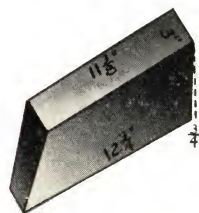
13 1/2" No. 2 Key
13 1/2" x (6"—4 3/8") x 2 1/2"
Also 13 1/2" x (6"—4 3/8")
x 3"



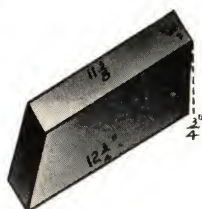
No. 101 Square Bung
13" x 4 1/2" x 3"



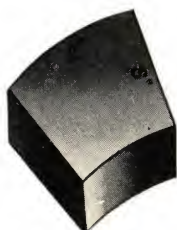
No. 103 Arch Bung
13" x 4 1/2" x (3"—2 5/8")



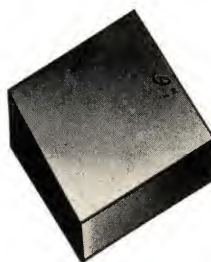
No. 102
Angle Bung
(11 3/8"—12 3/4") x
4 1/2" x 3"



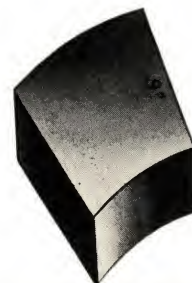
No. 104 Arch
Angle Bung
(11 3/8"—12 3/4") x
4 1/2" x (3"—2 5/4")



Cupola Blocks
(9"—) x 6" x 3"
Also (9"—) x 6" x 4"
No. of Diameter
Block Inside Outside
30 30" 42"
36 36" 48"
42 42" 54"
48 48" 60"
54 54" 66"
60 60" 72"
66 66" 78"
72 72" 84"



For Gas Flues
9" x 9" Arch
For 3', 4', 5' inside diameter
9" x 9" x (3 1/2"—)
Also 13 1/2" x 9" x (3 1/2"—)
For 3'—9" x 9" x (3 1/2"—2 1/4")
For 4'—9" x 9" x (3 1/2"—2-17/32")
For 5'—9" x 9" x (3 1/2"—2-11/16")
For 3'—13 1/2" x 9" x (3 1/2"—2 1/4")
For 4'—13 1/2" x 9" x (3 1/2"—2-17/32")
For 5'—13 1/2" x 9" x (3 1/2"—2-11/16")



9" Rotary Kiln Blocks
(9"—) x 9" x 4"
No. of Diameter
Block Inside Outside
48 48" 66"
54 54" 72"
60 60" 78"
66 66" 84"
72 72" 90"
78 78" 96"
90 90" 108"
102 102" 120"

Larger than 9 inch shapes not carried
in Duluth Stock

FEBRISCO Welded Solid Steel Sash

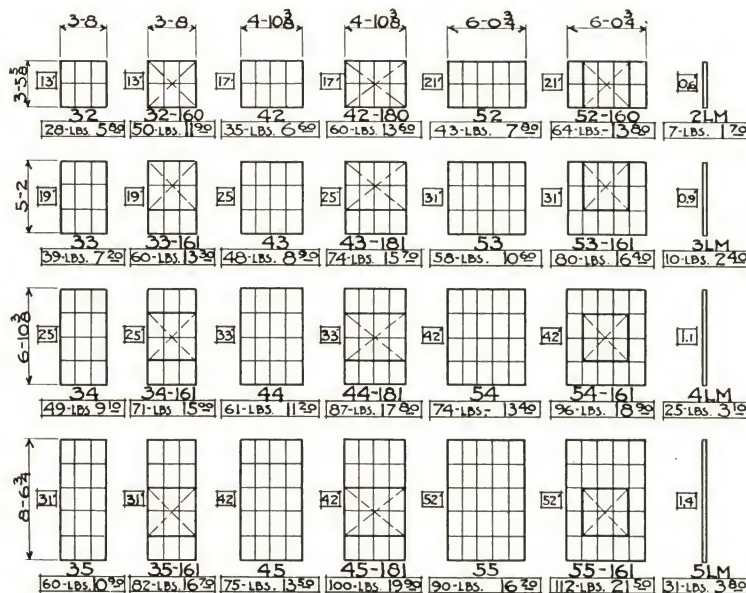
Standard Side Wall Units-Industrial Type Sash

SPECIAL FEBRISCO FEATURES

Solid Rolled Steel sections are used throughout. By Febrisco methods of electric welding it is unnecessary to cut away the section to pass the cross member. Members are welded together to produce a joint with the strength of the original section. This rigid

joint with FEBRISCO fabricating methods produces sash absolutely true to dimension and which cannot rack out of square in handling or erecting.

The exterior surface at the joint is absolutely smooth. There are no joints at which moisture can enter to set up rusting.



14x20 GLASS SIZE WAREHOUSE STOCK UNITS

OUR GENERAL CATALOGUE FURNISHED ON REQUEST SHOWS GREAT VARIETY OF UNITS OF SOLID STEEL SASH BOTH IN 1 1/2" AND OTHER GLASS SIZES, AND ALSO TOP HUNG CONTINUOUS SASH-OPERATING DEVICES-PROJECTED VENTILATOR SASH-STEEL STORE FRONT WINDOWS AND SOLID STEEL SKYLIGHTS.

STANDARD UNITS OF INDUSTRIAL SASH

Illustrations above show sizes which our factory carries in stock at all times. These are shown in 14 x 20" glass size.

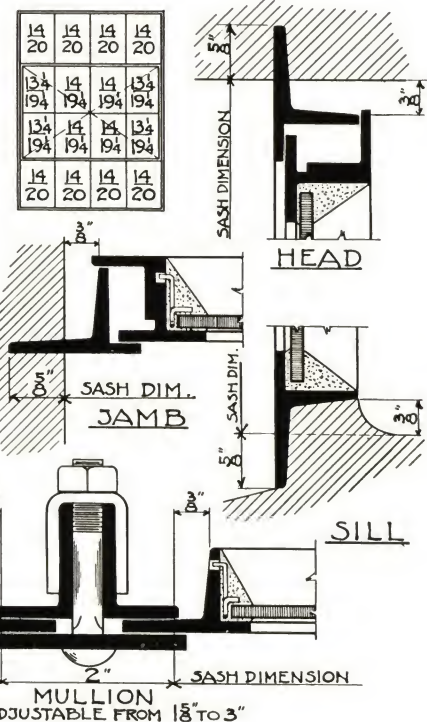
STANDARD UNITS which under normal conditions can be shipped on a few days notice are made in both 14 x 20" and 12 x 18" glass sizes, and in a very much larger variety than shown above. Ask for our general steel sash catalog.

Whenever the design of the structure will permit units of 14x20" glass size are recommended. This size is more economical in weight and price per square foot of area than the 12 x 18" glass sizes.

DIMENSIONS shown above and in our general catalog are the masonry openings into which the units fit. All industrial type sash are 1 1/2" longer and wider in their over-all dimensions than the figures given for masonry openings.

GLAZING

Industrial type units are supplied with spring wire copper coated glazing clips as standard. All units glaze from the inside.



VENTILATORS

When quotations on sash include ventilators unless otherwise specified our STANDARD CENTER PIVOTED VENTILATORS are furnished. The PIVOT is formed out of the sash members, contains no bolts, nuts, cotter pins or washers. Cannot stick and requires no adjustment. Ventilators can be removed without the use of tools for glazing or cleaning. Completely described in our general steel sash catalog.

DOUBLE CONTACT WEATHERING

All Ventilated sash have DOUBLE CONTACT WEATHERING continuous around all FOUR SIDES of the Ventilator. Both headers and sills are provided with wide overlap, which forms a perfect drip. Weep holes at sill to carry away condensation moisture.

UNDERWRITERS' LABELED SASH

Consult General Catalog. We can furnish any desired size on short notice.

Store Front & Show Window Sash — Ridge Ventilating Skylights

Special Type Solid Steel Sash with large lower Plate Glass pane for Store Front use are a new development of the FEBRISCO Factory. This sash, as well as a new departure in Ridge Ventilating Skylights, both employing solid rolled steel sections with all joints electrically welded, are described and profusely illustrated in our general Steel Sash Catalog. Ask for copy. We will gladly supply your requirements.

FEBRISCO Welded Solid Steel Basement Sash

60% to 80% More Light Through Same Opening

Basement windows get harder use and the least care of any sash in a building. Being at or near the ground they are usually damp and when wood sash are used usually swell and stick and rot out before they should.

Febrisco Welded solid steel sash will not rot, warp, stick or bind.

Wood frames and sash reduce the glass area. Our steel basement sash admit 60% to 80% more light than wood windows for the same size wall opening.

Febrisco Welded Solid Steel Basement Sash are positively weather tight — AND THEY STAY SO.

They cannot be broken by careless coal men as they are constructed of rolled steel sections with minimum thickness of $\frac{1}{8}$ " metal and ALL JOINTS ARE ELECTRICALLY WELDED.

APPEARANCE

The simplicity of design of our Steel Basement Sash gives a neat and attractive appearance. The method of manufacture by which all joints are electrically welded gives a smooth exterior surface free from projections. There are no open joints at any point through which moisture can enter to start rusting.

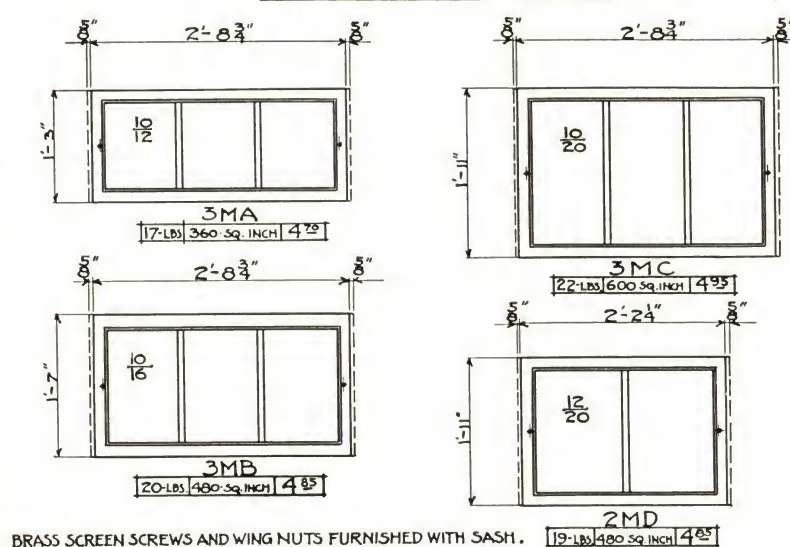
COST NO MORE THAN WOOD

Our Solid steel basement sash in practically every installation cost no more than wood. No carpenter being needed to fit the Sash to the frame, to attach the hinges and the locking device, both of which items are extras that have to be provided by the contractor when using wood sash, but which are permanently attached and a part of our steel sash results in a big economy. In addition each sash is given one coat of Red Oxide paint at the shop before shipment, saving the cost of priming coat at the building.

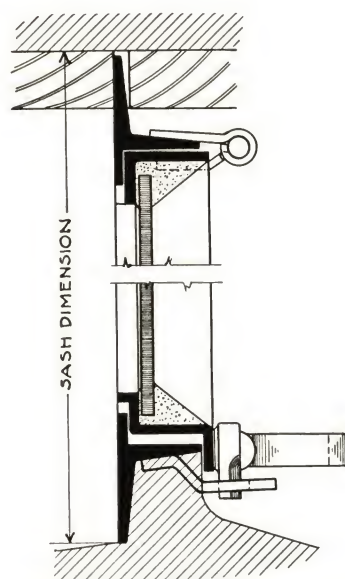
Steel Basement sash are always shipped unglazed. Clips for attaching glass accompany each sash. STEEL SASH putty should always be used. About one pound required for each 12 x 20" light.

Standard Sizes of Basement Windows

BASEMENT WINDOWS



BRASS SCREEN SCREWS AND WING NUTS FURNISHED WITH SASH.



VERTICAL SECTION THRO BASEMENT SASH

INSTALLATION

FEBRISCO Welded Solid Steel Basement Sash can be installed in masonry, concrete block, tile, brick, poured concrete, veneer or stucco walls. Jamb section is exactly as shown above in vertical section through sash, and is readily adaptable to any type of construction. Ventilator is DOUBLE WEATHERED at all points.

SASH EASILY REMOVED

The ventilator is fastened to the frame by strong and substantial hinges, fitted with removable pins which allow the Ventilator to be quickly and easily taken out for glazing. The cam lock is strong and serviceable. When closed and the handle turned into locking position the ventilator is forced into a continuous double contact with the frame, insuring a rain proof and air tight window.

SCREENING

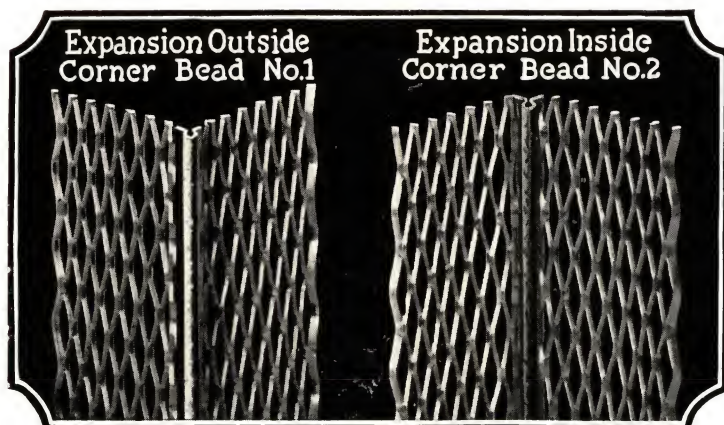
Fly screens and storm sash are easily attached to our FEBRISCO Steel Basement sash. Each sash is fitted with brass screws and wing nuts. Holes are drilled through the screen, the brass screws run through and the screen or storm sash brought up snug by turning up the wing nuts. When screens or storm sash are not in place the wing nuts are run up on the brass screws where they are always ready for use and closing the screw holes on the frame.

STANDARD SIZES

Style No.	No. of Lights	Size of Glass	Masonry Opening	Prices
3 MA	3	10x12	1'3"x2'8 3/4"	Quoted on Application
3 MB	3	10x16	1'7"x2'8 3/4"	
3 MC	3	10x20	1'11"x2'8 3/4"	
2 MD	2	12x20	1'11"x2'2 1/4"	

CORNER BEADS

Standard Lengths--6, 7, 8, 9 and 10 ft.



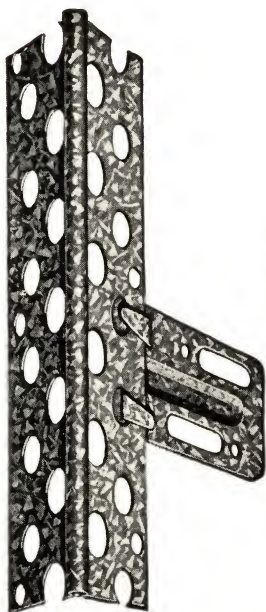
The plaster-gripping qualities of Expansion Corner Beads, are unequaled. The expanded metal wings permit the plaster to key through to the lath beneath and thus a permanent bond is obtained. They reinforce and protect the plaster at the most vulnerable points.

COST MORE BUT ARE WORTH IT

No. 1—Outside Bead carried in Duluth Stock.
No. 2—Inside Bead factory shipment only.

Standard lengths as above.

Shipping weight — approximately 230 pounds per M feet. Crated.



STANDARD CORNER BEAD

Used on walls of tile, gypsum block, wood or metal lath. Made in 26 ga. weighing .179 pounds per lineal foot. Packed in bundles of 10 beads each.

Illustration shows also our

No. 501—GF STANDARD CORNER BEAD CLIP

Shipping weight approximately 30 pounds per M.

Clip not necessary on wood lath.



Four-fifths Size

No. 30 RICHSTO CORNER BEAD

26 gauge

Shipping weight—approximately 211 pounds per M. feet.



Two-thirds Size

No. 10—RICHSTO CORNER BEAD

26 gauge

Shipping weight—approximately 176 pounds per M. feet.



Two-thirds Size

No. 20—RICHSTO CORNER BEAD

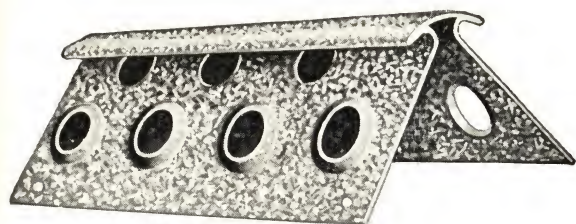
26 gauge—Extra long flange

Shipping weight—approximately 220 pounds per M. feet.

Quotations on request.

Bull Nose Corner Beads

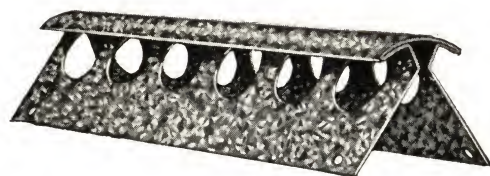
Standard Length--10 feet



No. 531—GF Bull Nose Bead

$\frac{3}{4}$ " Radius, 24 gauge

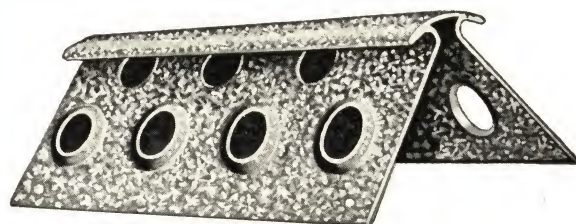
IMPROVED Long Flange, Cup Shaped Perforations forming a perfect key. Shipping weight approximately 553 lbs. per M. feet.



No. 532—GF Bull Nose Bead

$\frac{3}{4}$ " Radius Medium Length Flange. 24 gauge.

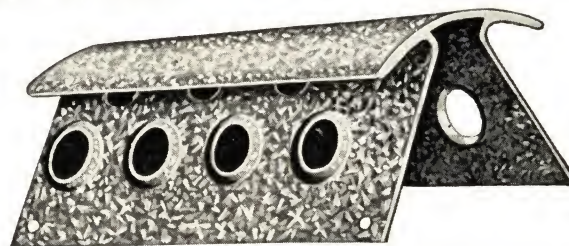
Shipping weight approximately 420 pounds per M. feet.



No. 541—GF Bull Nose Bead

$\frac{3}{4}$ " Radius, 26 gauge

IMPROVED Long Flange, Cup Shaped Perforations forming a perfect key. Shipping weight approximately 460 pounds per M. feet.



No. 544—GF Bull Nose Bead

$1\frac{1}{2}$ " Radius, 24 gauge

IMPROVED Long Flange, Cup Shaped Perforations forming a perfect key. Shipping weight approximately 650 pounds per M. feet.



No. 550—GF Bull Nose Bead

$\frac{3}{4}$ " Radius, 26 gauge

Short Flange. No. 123 clip required. Clips extra. shipping weight—approximately 236 pounds per M. feet.

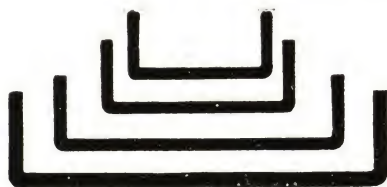


No. 553—GF Bull Nose Bead

$1\frac{1}{2}$ " Radius, 26 gauge

Short flange. No. 123 clip required. Clips extra. Shipping weight—approximately 390 pounds per M. feet.

STEEL CHANNELS



Illustrations show actual sizes of Channels

GF Cold Rolled Channels

Made from U. S. 16 gauge steel in $\frac{3}{4}$ in., 1 in., $1\frac{1}{2}$ in. and 2 in. wide. Factory stock in lengths of 12, 14, 16, 18 and 20 feet.

Sizes marked "*" in Duluth Stock.

DIMENSIONS

* $\frac{3}{4}$ in. wide	Leg $11/32$ in. high	276 lbs.
* 1 in. wide	Leg $3/8$ in. high	332 lbs.
$1\frac{1}{2}$ in. wide	Leg $3/8$ in. high	442 lbs.
* 2 in. wide	Leg $7/16$ in. high	580 lbs.

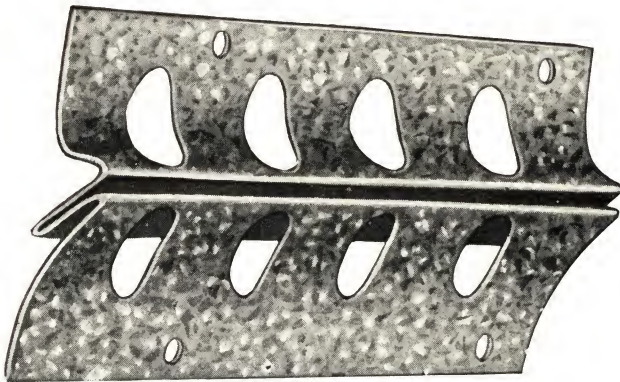
PERFORATED CHANNELS

$1\frac{1}{2}$ in. wide	Leg $3/8$ in. high	400 lbs.
2 in. wide	Leg $7/16$ in. high	547 lbs.

Approx. Wt. per
1000 lineal ft.

Base Grounds, Picture Mould, Etc.

Picture Mould



Three-fourths Size

No. 70 Concealed Picture Moulds

26 gauge

Shipping weight—approximately 236 lbs. per M. feet.

Wall Ties



One-half Size

No. 66 Veneer Wall Ties

Shipping weight—approximately 45 pounds. 1000 to the box.

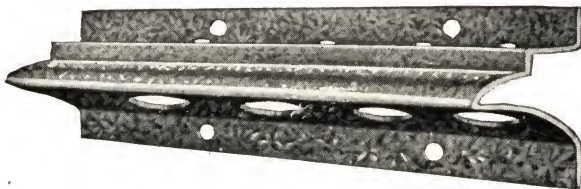
Corner Bead Clip



One-half Size

No. 123 Corner Bead Clip

Weight approximately 32 pounds per M.



Two-thirds Size

No. 74 Curved Point Base Screed

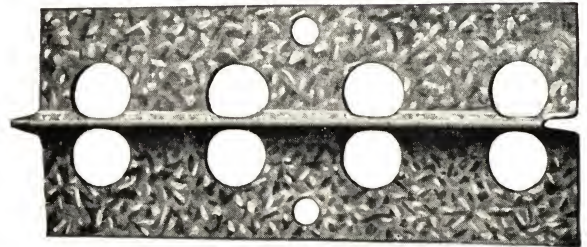
26 gauge

The grounds on top and bottom of this screed are $\frac{1}{2}$ " and 1" respectively.

Shipping weight—approximately 202 pounds per M. feet.

Clips for attaching—39 pounds per 1000.

Screed and Ground



Five-sevenths Size

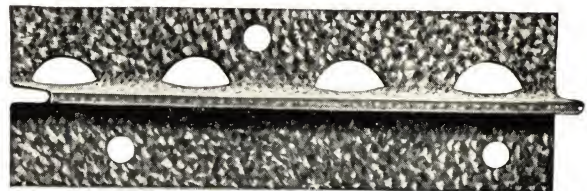
No. 60 Base Grounds—26 gauge

No. 62 Base Grounds—24 gauge

For $\frac{1}{2}$ ", $\frac{5}{8}$ " or $\frac{3}{4}$ " Ground

Shipping weight for No. 60 approx. 170 pounds per M. feet.

Shipping weight for No. 62 approx. 240 pounds per M. feet.



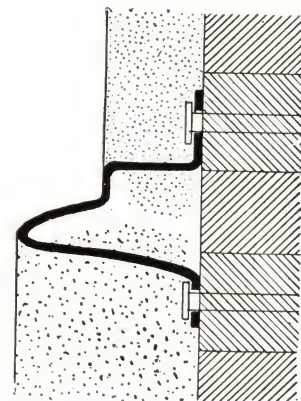
Five-sevenths Size

No. 59 Base Ground

26 gauge

For $\frac{3}{8}$ " and $\frac{1}{2}$ " Ground

Shipping weight—approximately 155 pounds per M. ft.



FULL SIZE DETAIL No. 74 Screed



GF Peds

Spot Grounds for Floor Screeds and for Wood or Metal Trim

PEDS are "spot grounds" for attaching wood and metal trim to walls, and floor screeds to concrete floors. They supplant old-fashioned methods of grounding that are costly in time, labor, and material. Use of Peds on any job will result in such a marked saving in skilled labor, time, and

All leveling, wedging and bracing of screeds is eliminated and a secure and accurate anchorage is obtained at a decided saving in cost.

Peds for walls greatly simplify the placing of baseboards, chair rails, plate rails, and picture moulding. They also afford a firm foundation for plumbing fixtures, hand rails, electrical fixtures, and telephone boxes, and for attaching wallboard or plasterboard over masonry walls. Wall Peds adhere tightly to any metal lath, brick concrete, gypsum block or hollow tile wall, and hold trim and fixtures solidly and securely.

In setting Wall Peds, a dab of common hard wall plaster is spread over the back of the Ped, and it is pressed against the wall until the plaster keys through the holes in the metal disk, and the face of the Peds brought to proper alignment. Peds are spotted in the corners of the room first, at the proper height from the floor. The intermediate Peds are then lined up with these by means of a line or straight edge. Trim is nailed directly to the Peds.

Peds are packed in boxes. A box of Wall Peds contains 900 half-inch Peds and a package of 50 three-quarter inch Peds and 50 quarter-inch Peds to take care of inequalities in the wall. A box of Floor Peds contains 900 three-quarter inch Peds and 100 half-inch Peds.



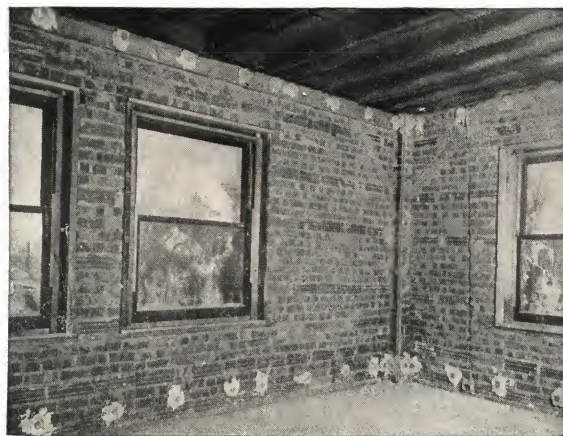
GF Floor Peds Give a Firm Foundation for Screeds and are easily placed

money that no architect or contractor who tries Peds will return to the old method of grounding.

Each Ped consists of a round nailing block of wood securely clinched into a circular metal disk which has holes punched in it. Through these holes plaster—by which it is applied—is forced. The completed plaster wall holds the Ped firmly in place.

Peds are used on concrete floors to give a firm foundation and a positive anchor for the screeds or sleepers to which the floor is nailed. Peds are also used for anchoring carpet strips in cement floors. In setting Floor Peds, Portland cement mortar is used, and guide Peds may be set 14 to 16 ft. apart to the desired level. When these Peds are firm, a line may be stretched to mark the elevation of intermediate Peds which may be quickly and accurately placed by forcing each Ped into a bed of cement mortar to the level of the guide line.

Floor Screeds are nailed directly to the Peds after the mortar has set.



GF Wall Peds Adhere Firmly to Any Wall Surface, and Greatly Cut the Cost of Grounding

Herringbone Rigid Metal Lath

Herringbone is a metal lath with a distinctive mesh. This mesh pattern, which easily distinguishes Herringbone from any other type of plaster base, was adopted not for the purpose of producing a novel effect or for convenience in manufacture but to effect a true economy at every stage in the production of a finished plaster wall.

Herringbone was first designed and then special machinery constructed to produce it. In fact several additional operations not required by more simple patterns are necessary to make Herringbone.

A study of the Herringbone pattern will demonstrate why this metal lath enjoys the popularity it holds among architects, contractors and plasterers in general.

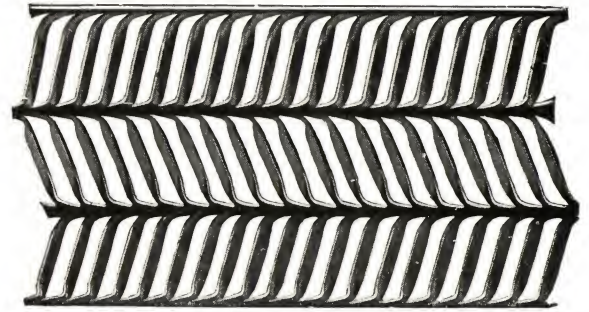
Herringbone Metal Lath is made up of a series of parallel reinforcing ribs running lengthwise of the sheet and connected by short cross strands. The longitudinal ribs lie at an angle to the plane of the sheet and not only serve as supporting members for the lath and plaster but also act first as "baffle plates" to deflect the excess mortar back against the trowel, and then as "shelves" on which the mortar rests and is held in place while setting.

The cross strands are flattened to prevent the cutting of the mortar and to guide it around and behind each strand giving a perfect key and thoroughly embedding the metal.

By the use of Herringbone very little mortar is lost from falling back of the lath and just enough is used to produce the desired finished surface and protect the lath.

The interlocking edges of Herringbone are another distinct economy feature. No side-lapping of sheets required. This feature alone saves an inch or more for every sheet applied. A common adage and one literally true is "A yard of Herringbone on the wagon is a yard on the wall."

Herringbone is self-furring lath. The slanted ribs keep it away from studs far enough to allow plaster to firmly key behind it.



HERRINGBONE METAL LATH

Herringbone is the most rigid metal lath obtainable. Rigidity makes Herringbone easy to handle and apply by one man without a helper. It requires no stretching and does not sag between supports; saves mortar and the workman's time in plastering and allows wider stud spacing by about 25 per cent.

Herringbone Metal Lath is obtainable in steel—painted or galvanized—and in Armco Ingot Iron as follows:—

HERRINGBONE METAL LATH (STANDARD)

Size of Sheets—20¼" x 96" (1½ sq. yds.)

Weight—PAINTED—*2.2, 2.5, 3 and *3.4 lbs per sq. yd.

Weight—GALVANIZED—2.5 and 3.4 lbs. per sq. yd.

Weight—ARMCO—*2.2, 2.5, 3 and *3.4 lbs per sq. yd.

Packed 15 sheets—22½ yds. to the bundle.

*"—Carried in Duluth Stock.

"AAA" HERRINGBONE METAL LATH

In this style the ribs are made heavier than in standard Herringbone. This increases the weight and the added rigidity permits a wider stud spacing, as shown in the table below. "AAA" Herringbone insures excellent results whether used for partitions, ceilings or cement siding.

Sizes of Sheets—18" x 96" (1-1/3 sq. yds.)

Packed 15 Sheets—20 sq. yds. to the bundle.

Stud Spacing Center to Center		Weight lbs. per Sq. Yd.		
Walls	Ceilings	Painted	Galvanized	Armco
16"	16"	2.5		2.5
16"	16"	2.8	Not	2.8
24"	24"	3.8	Made	3.8

Diamond Rib Lath

Diamond Rib Lath is an expanded metal lath with a diamond shaped mesh reinforced with longitudinal triangular shaped ribs $\frac{3}{8}$ inch high. It is especially adapted for use on long spans, such as ceilings under steel lumber, etc.

DIAMOND RIB STANDARDS

Sheets 24" wide (c-c outside ribs) x 96" long.
Ribs spaced 4.8" c-c.
Area of Sheet 1 7-9 square yards.

Weight—Painted—2.5, 3.0, 3.5 and 4.0 lbs. per sq. yd.

Weight—Galvanized—Not furnished galvanized.

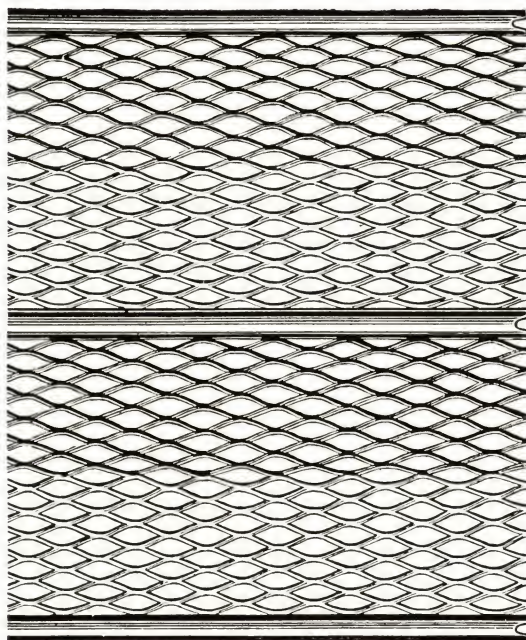
Weight—Armco—3.5, 4.0 lbs. per sq. yd.

Packed 9 Sheets — 16 yards to the bundle.

Carried in Duluth Stock

Maximum Spans for GF Diamond Rib Lath in Steel Lumber Construction

Weight Per Sq. Yd.	Floors Over Joist	Ceilings Under Joist	Partitions
4.0	24"	.....	36" and up
3.5	19" or 24"	24"	30"
3.0	16" or 19"	19"	24"



GF Diamond Rib Lath

Key Expanded Metal Lath



Key expanded Metal Lath is adapted for all kinds of work, but is especially suitable for curved surfaces, due to its uniform pliability.

The flat ribs make Key Lath easy to handle and erect. The

small mesh insures its complete envelopment in plaster, with the use of a minimum amount of material. The large sheets reduce the number of laps and save both labor and material.

FURNISHED AS FOLLOWS

Key Lath is furnished in steel, painted or galvanized, and in Armco Ingot Iron. No unpainted lath. Sheets — 24 x 96 inches — 1-7/9 square yard. Packed 15 sheets — 26-2/3 yards to the bundle. Furnished in the following weights:

Steel—Painted—*2.2, *2.5, 2.8, 3 and *3.4 lbs. per sq. yd.

Steel—Galvanized—*2.5 and *3.4 lbs. per sq. yd.

Armco, 2.2, 2.5, 2.8, 3 and 3.4 lbs. per sq. yd.

Copper bearing—2.8, 3.0, 3.4 lbs. per sq. yd.

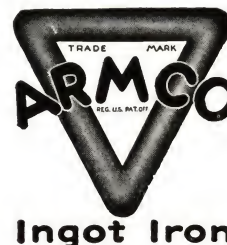
" * " Carried in Duluth Stock.

GF Metal Lath made from Armco Ingot Iron

While under ordinary conditions, metal lath properly painted or galvanized and embedded in plaster is effectively protected from rusting, there are times when it is considered desirable, because of exceptional conditions such as salt sea or acid atmosphere or where certain kinds of patent plasters are used, to take the added precaution of using GF Metal Lath made from sheets of Armco Ingot Iron.

Although Armco Ingot Iron Lath is used for both plaster and stucco work, it is especially preferred by some architects for the latter, as its use positively insures permanency at but a slight additional expense.

Herringbone, Diamond Rib or Key Lath are obtainable in Armco. Metal Lath of Armco is identified by its red paint coating and the special seal with which each bundle is tagged.



Self - Sentering

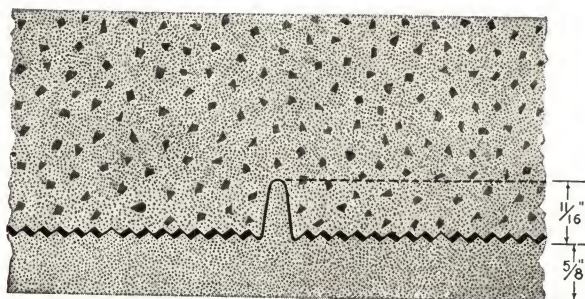
A Combined Form, Lath and Reinforcement for Concrete Walls, Floors, Roofs and Miscellaneous Fireproofing

SELF-SENTERING is a ribbed expanded metal for concrete floor reinforcing and miscellaneous fire-proofing. It serves as both form and reinforcement for concrete floor work and as a combined steel lath and studding for walls and partitions.

Self-Sentering is made up of a series of heavy, cold-drawn ribs 11-16-inch high, always spaced $3\frac{3}{8}$ inches center to center, connected by the most efficient form of expanded metal — the diamond mesh — all cut and drawn from one sheet of steel.

The connecting fabric is designed on the only true principle of expanded metal reinforcement. The diamond shaped mesh diffuses the stresses from concentrated loads, affords effective continuity of the reinforcement and assures that every ounce of the metal is effective to resist tensile stresses.

No breaks occur at right angles to the line of stress and there is no strength sacrificed in strands that act solely as connecting members. The diamond mesh affords a perfect mechanical bond for the concrete, giving a bonding surface fully eleven times as great as the same effective sectional area in reinforcing bars. This style of mesh also affords a perfect key for plaster or mortar.



A Cross Section of a Concrete Slab Showing
Location of Self-Sentering

Self-Sentering Data

Size of sheets—29 inches wide by lengths of 4, 5, 6, 7, 8, 9, 10, 11 and 12 feet. Longer lengths up to 14 feet furnished on special order. Intermediate lengths will be cut from the next longer sheet and any waste charged to customer.

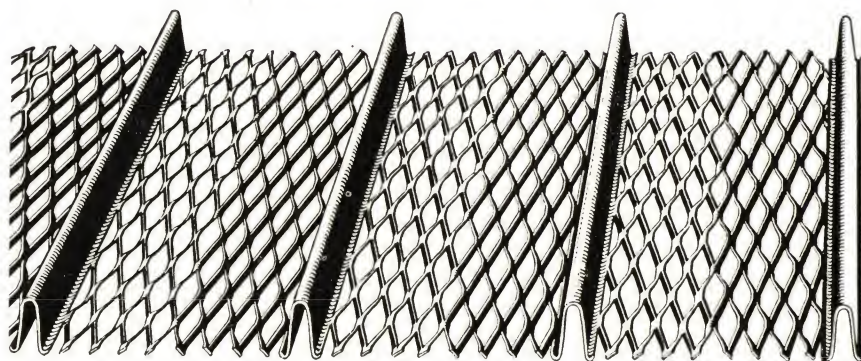
Height of ribs, 11-16 inch.

Spacing of ribs always $3\frac{3}{8}$ inches, center to center.

Furnished either painted or galvanized—no unpainted material.

Galvanized Self-Sentering furnished on special order only.

Made regularly in the following gauges and weights:



Weights and Sectional Areas

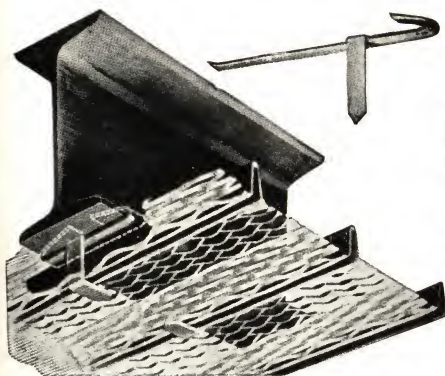
GAUGE	Painted Weight Per Sq. Ft.	Galvanized Weight Per Sq. Ft.	Effective Sectional Area Per Ft. of width
28	.56 lbs.	.71 lbs.	.167 sq. in.
26	.65 lbs.	.80 lbs.	.193 sq. in.
24	.75 lbs.	Not Made	.223 sq. in.

Note that Self-Sentering made from galvanized sheets, also from Armco Iron and all special gauges as shown above, is furnished only on special order and with the usual delays incident to mill delivery of sheets.

Area of Sheets of Various Lengths

Length	Area Sq. Ft.	Length	Area Sq. Ft.
1 inch	.202	6 ft. 0 in.	14.5
3 inch	.604	6 ft. 6 in.	15.7
4 inch	.806	7 ft. 0 in.	17.0
6 inch	1.21	7 ft. 6 in.	18.2
1 ft. 0 in.	2.42	8 ft. 0 in.	19.4
1 ft. 6 in.	3.7	8 ft. 6 in.	20.6
2 ft. 0 in.	4.9	9 ft. 0 in.	21.8
2 ft. 6 in.	6.1	9 ft. 6 in.	23.0
3 ft. 0 in.	7.3	10 ft. 0 in.	24.2
3 ft. 6 in.	8.5	10 ft. 6 in.	25.4
4 ft. 0 in.	9.7	11 ft. 0 in.	26.6
4 ft. 6 in.	10.9	11 ft. 6 in.	27.8
5 ft. 0 in.	12.1	12 ft. 0 in.	29.0
5 ft. 6 in.	13.3		

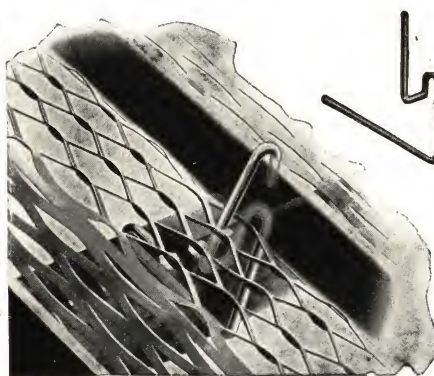
Methods of Attaching Self-Sentering to Structural Members



Ceiling Clip

This clip is for fastening Self-Sentering to I-beams and channels. In ceiling or wall construction the prong is electrically welded to the clip and the device possesses unusual strength. It is very simple of application and is made in the following sizes for the various structural members:

Style No.	For Use On
C-1.....	8" to 12" I-Beams
C-2.....	15" and 18" I-Beams
C-3.....	20" and 24" I-Beams
C-4.....	3" and 4" Channels
C-5.....	5" and 6" Channels
C-6.....	7" and 8" Channels
C-7.....	9" and 10" Channels
C-8.....	12" and 15" Channels

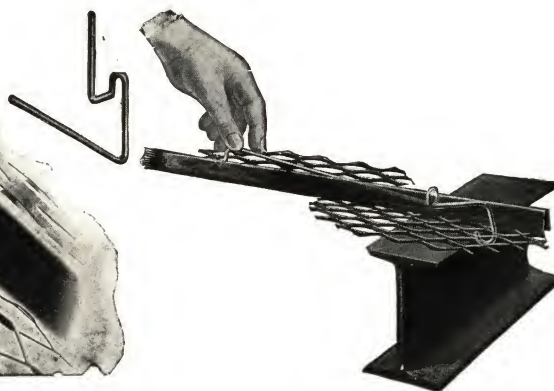


Clip No. 4

This clip is used for attaching Self-Sentering to all angles. Always give the size of angles to be used, or order by the following style numbers:

Angles under 3 in. x 3 in.—Style 4.75
Angles over 3 in. x 3 in.—Style 4.10

Both of these clips are made of No. 10 U. S. Gauge soft annealed wire and are very easy to place.



Clip No. 7

This clip for fastening Self-Sentering to the face of I-Beams, channels or angles in the construction of roofs and floors, is very effective. Applied entirely from the upper side and one man can place them very rapidly. The hook end of the clip is inserted through the mesh to the side of the rib. Clip is drawn up until hook rests against underside of flange. Then the V-shaped portion is placed astride the rib and free end is brought down to the mesh and hooked under the rib.

Data Regarding Loads

Table No. 1

For ordinary spans, Self-Sentering does not require centering, but to insure best results the spans shown in table following should not be exceeded without using temporary supports until concrete has set. These spans are center to center of supports.

Weight Self Sentering per sq. ft.	Slab Thickness			
	2 in.	2½ in.	3 in.	3½ in.
.56 lb.	3' 3"	3' 0"	2' 9"	2' 6"
.65 lb.	3' 6"	3' 3"	2' 9"	2' 9"
.75 lb.	4' 0"	3' 8"	3' 4"	3' 0"

TABLE NO. 2

The following load table shows *safe live loads* per square foot, uniformly distributed. To get the total live and dead load, add to the figures shown 12 pounds for each inch in thickness of the slab, plus 6 pounds per square foot for the undercoating of plaster. For instance, a 2-inch slab would weigh $2 \times 12 = 24 + 6 = 30$ pounds per square foot; thus a 2-inch slab reinforced with .75 lb. Self-Sentering on a 4-foot span is good for a live load of 229 pounds per square foot, or a total live and dead load of 229 pounds plus 30 pounds, which equals 259 pounds per square foot.

The slab thickness as shown in every instance, is considered as above the mesh of the Self-Sentering and the plastered coat underneath is not included in the computation. The tables are based on a 1:2:4 concrete mix.

Round rods should always be placed over the top of the heavy ribs to take care of temperature stresses. These should be about ¼-inch diameter or No. 5 wire, spaced 30 inches on centers and run at right angles to the ribs.

Safe Uniformly Distributed Live Loads per Square Foot on Self-Sentering Slabs

Stress in steel — 16,000 pounds per square inch.

Ratio between the moduli of elasticity — $n=15$.

Center of gravity — .19 of an inch above bottom of slab.

R. M. = Resisting Moment per foot width in inch pounds; $f c$ = maximum extreme fibre stress in concrete.

Bending Moment $\frac{WL}{10}$

SAFE LIVE LOAD TABLE

Thickness of slabs above mesh	Weight Self Sentering per Sq. Ft.	Max. Stress in Concrete lb per Sq. In.	Mo-ment of re-sis-tance per ft. of Width	Safe Live Load lbs. per sq. ft										
				Span										
				3 ft.	4 ft.	5 ft.	6 ft.	7 ft.	8 ft.	9 ft.	10 ft.	11 ft.		
2"	.56 lb.	700	4557	392	207	122	75	48	29					
	.65 lb.	700	4774	412	219	129	80	51	32					
	.75 lb.	700	4984	431	229	136	85	55	35					
2½"	.56 lb.	630	6144	532	283	168	106	68	44	27				
	.65 lb.	690	7052		332	199	127	84	56	37				
	.75 lb.	700	7525		356	215	138	92	62	41				
3"	.56 lb.	560	7551		352	210	133	86	56	36				
	.65 lb.	610	8657		408	247	158	106	71	46	30			
	.75 lb.	670	9939		475	289	188	127	87	60	41			
3½"	.56 lb.	510	8964		419	251	160	104	69	44	27			
	.65 lb.	555	10290		487	295	190	127	86	58	38			
	.75 lb.	605	11797			346	226	153	106	73	50	33		
4"	.56 lb.	470	10377		486	292	186	123	81	53	32			
	.65 lb.	515	11926			343	222	149	101	69	45	58		
	.75 lb.	555	13672			402	264	178	124	87	60	40		

B. M. = $\frac{1}{10} WL^2$ For B. M. = $\frac{1}{12} WL^2$ add 20% to above loads.
For B. M. = $\frac{1}{8} WL^2$ deduct 20% from above loads

Self-Sentering Floors

SELF-SENTERING is the ideal reinforcement for every type of concrete floor. It can be used for floors supported by steel, wood or concrete beams, providing great strength and adding greatly to the fireproofness of the entire structure.

Because Self-Sentering is both form and reinforcement the expensive part of concrete floor construction—form work—is eliminated and the cost of the completed floor is greatly reduced.

The open mesh-work of Self-Sentering requires a moderately dry concrete, which assures a minimum amount of water and a correspondingly stronger slab.

The construction of Self-Sentering floors is very similar to that of Self-Sentering roofs, with the exception that the floor must be built heavier to support the greater loads.

The various types of floor shown here have each their individual merits, but all are alike in certain respects, viz.: economy in erection due to absence of form work, great strength compared to their light weight, and their permanent, fireproof and sanitary character.

Concrete floors have easily proved themselves the most enduring type, and with expensive form work eliminated by Self-Sentering, their cost has been reduced to compare favorably with all other types. The use of lighter slabs made possible by Self-Sentering has cut the weight to a minimum permitting other economies in the design of structural members.

With Self-Sentering, acting as form and reinforcement, the danger of premature removal of forms is impossible.

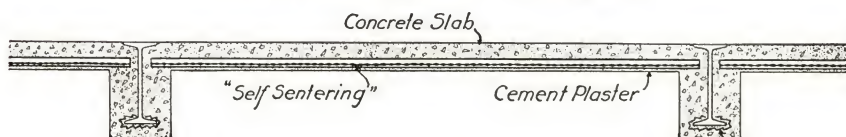
Self-Sentering Floor—Type No. 1



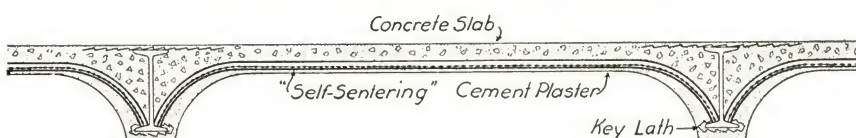
Self-Sentering Floor—Type No. 2



Self-Sentering Floor—Type No. 3



Self-Sentering Floor—Type No. 4



Self-Sentering is attached direct to steel beams by clips as shown on page 41, concrete applied to the desired thickness and the underside plastered with cement mortar. Sides of beam boxes are wired together to save bracing across the span. To permit pouring the beam haunching at the same time, punch out the mesh between the Self-Sentering ribs where they come over the beam.

This type of floor is the same as No. 1, except that beams are fireproofed with metal lath and plastered. This can be done at the same time the underside of the slab is plastered.

Self-Sentering sheets rest on the edges of beam boxes used as forms for the beam fireproofing. Self-Sentering acts as both form and reinforcement.

Self-Sentering sheets, with ends curved to the proper radius at the factory, rest on the lower flange of steel beams, acting not only as reinforcing and centering for the slab, but as a form for the fireproofing of the sides of the beam. The bottom of the beam is wrapped with Expanded Metal Lath and plastered at the same time as the underside of the slab. By using Style "3-10-265" Expanded Metal over the supports as shown, cracks will be prevented along the supporting beam.



Oak Hill High School, Oswego, N. Y. Self-Sentering used for roofs, floors and suspended ceilings.
Contractor, Peter Raby & Son, Oswego, N. Y.

Self-Sentering on Wood Joist Floors

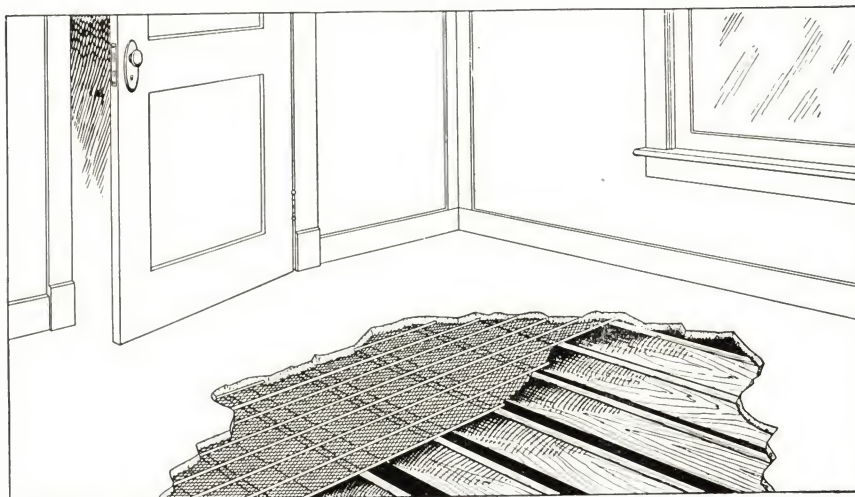
In the detail sketch at the bottom of this page is shown an approved method of building concrete floors in wood frame structures. Self-Sentering is stapled directly to the floor or roof joists, rib side up and the concrete poured. Any desired floor finish can be laid above the concrete by placing nailing strips or sleepers in position before pouring, or by attaching same by the use of our Munson Floor Clip (see page 57) or by the use of PEDS (see page 37).

GF No. 10 Integral Waterproofing Paste should be used for floor waterproofing and GF No. 250 Waterproofing Mastic should be used for roof waterproofing.

NOTES—For floor and roof construction where heavy timbers are available, it is often possible to effect a saving by spacing these heavier joists at from 6 ft. to 12 ft. centers, increasing the thickness of the slab and including additional reinforcement which may be either rods, expanded metal or wire mesh. (See pages 12, 13, 51, 52 and 53).

In a separate booklet we publish tables for flat slab construction under these conditions. Copy of this booklet gladly furnished on request.

In curtain walls and solid partitions, Trussit, because of its uniform expansion, is the best material obtainable., (See description, Weights, etc. Page 54).



Detail of Self-Sentering Floor Over Wood Joist—Semi-Fireproof Construction

Self-Sentering Roofs

REINFORCED concrete makes the highest type of roof — at once fireproof and enduring, and with practically no maintenance expense. The only objections ever made to a concrete roof have been its comparatively high cost and weight. The use of Self-Sentering as both form and reinforcement overcomes both of these.

First, because very few forms are required in spans longer than those shown in table 1, page 41 and none where the spans are equal to or less than those called for in this table.

Second, because the large sheets permit the rapid erection of such a roof with a minimum labor cost. These same large sheets require the fewest possible laps which also increases labor efficiency.

Third, because the slabs need be but 2" thick for spans up to 8' centers and this fact ordinarily cuts the dead load considerably as compared with the ordinary concrete roofs.

Though Self-Sentering Roofs are comparatively light, a study of the Safe Load Tables given on page 41 show that their strength is far in excess of all roof requirements.

Self-Sentering Roofs are particularly adapted to steel frame buildings, but they are used economically and effectively on wood or concrete framing as well. The sheets are merely laid over the roof purlins, attached to them securely by clips, wire, nails or staples and the concrete applied to the required thickness. Only enough passes through the mesh to thoroughly bond to the steel. The underside is then plastered with cement mortar and the roof is complete, ready for waterproofing.

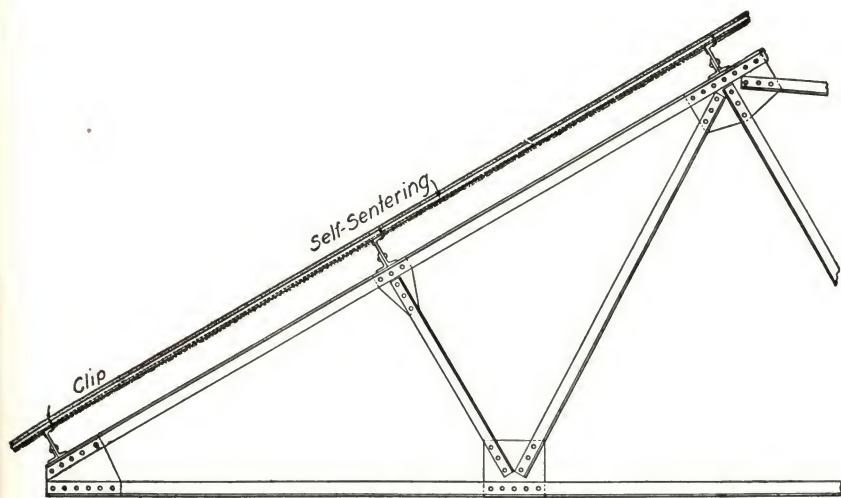
Self-Sentering opens up a comparatively new field for concrete roofs, namely, on buildings where pitched roofs are desired. Heretofore pitched roofs of concrete have not been considered practicable as there was no economical method of keeping the concrete in place on the inclined surface until it had set. Self-Sentering, in addition to acting as form and reinforcing, also gives a bond for the concrete so that it is readily used on roofs of any character — pitched roofs, domes, saw-tooth or flat — and at practically the same cost for one as for the other.

Self-Sentering allows such a diversity of roof construction that it has considerable architectural value and as a result it is being used on buildings where concrete roofs formerly could not be considered. For complete specifications, see pages 46 and 47.



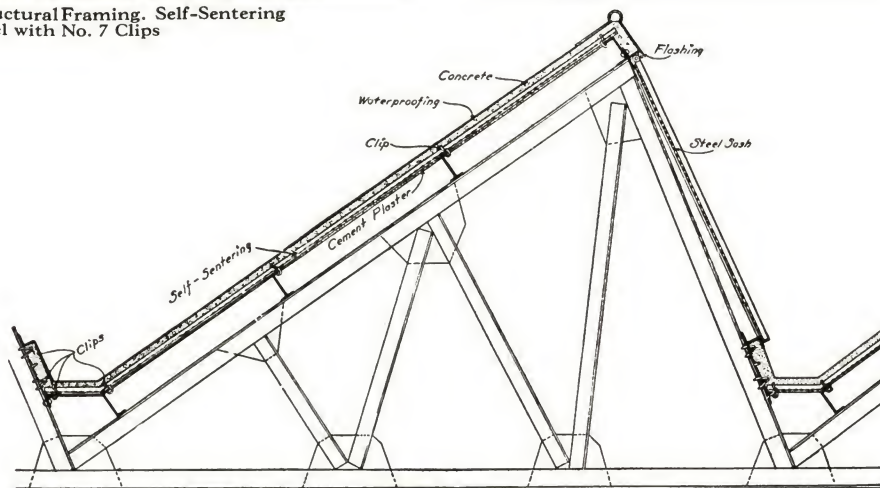
Self-Sentering Roof, Underwood Bldg., San Francisco. Architect, L. P. Hobart, Contractor, H. A. Chalmers

Details of Self-Sentering Roofs

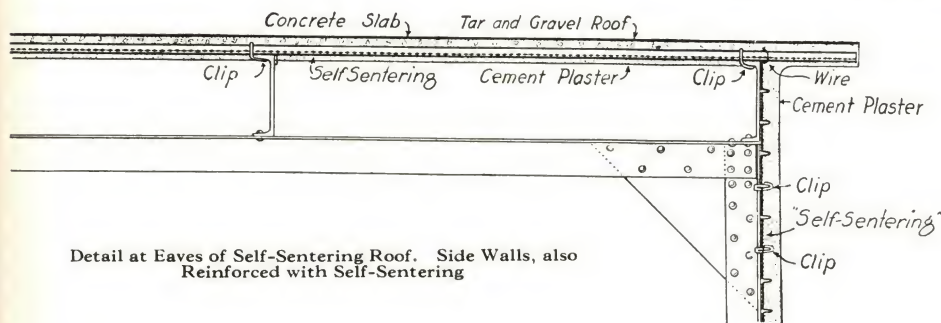


Detail of Ordinary Pitched Roof on Structural Framing. Self-Sentering Attached to Steel Channel with No. 7 Clips

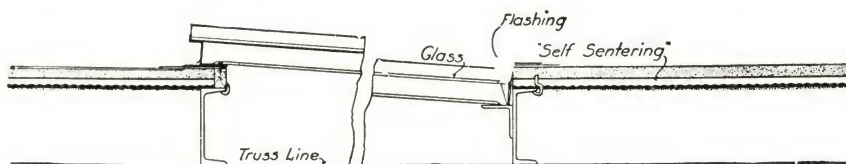
Details of some of the various types of Self-Sentering roofs are here shown. The method of using this material and the variety of purposes it can be made to serve are limited only by the skill of the engineer or his familiarity with the qualities of Self-Sentering.



Detail of Self-Sentering Saw-Tooth Roof



Detail at Eaves of Self-Sentering Roof. Side Walls, also Reinforced with Self-Sentering



Detail of Skylight in a Self-Sentering Roof

Self-Sentering Roof and Floor Specifications

Self-Sentering

SELF-SENTERING, with heavy ribs $3\frac{5}{8}$ inches center to center (manufactured by The General Fireproofing Co., Youngstown, Ohio), to be used on all concrete roofs and floors as indicated on plans. The Self-Sentering to be rigidly attached to supporting members by special clips supplied by the manufacturer or by tie wire (No. 18 gauge preferred).

(Note: See Safe Load Tables for gauge and areas of Self-Sentering and thickness of slab for various spacing of supports, page 41.)

The clips or tie wire, securing the Self-Sentering to the supports, to be spaced not more than $7\frac{1}{4}$ inches apart, i. e., one clip at every other rib at each bearing point and clamped so that the Self-Sentering is firmly held in place.

The side ribs of Self-Sentering sheets to interlock and be securely fastened together by clinching with a special punch; the ends to lap at least 2 inches where lap comes over support and not less than 8 inches if laps occur between supports. Where sheets lap between supports, ends of adjoining sheets to be securely fastened together by punching or wiring.

(Note: Sheets may often be fastened together on the ground, by clinching the side ribs, rolled up and hoisted into place five or six at a time.)

Concrete

Proper planking to be placed on top of sheets to enable workmen to wheel concrete without damaging the Self-Sentering.

Concrete to form a slab of the required thickness shall then be placed on top of the Self-Sentering and shall consist of a mixture of one part Portland cement, two parts of clean sand, and four parts of fine gravel or crushed stone to pass a $\frac{1}{2}$ -inch screen and of a consistency which will permit the concrete to key through the mesh of Self-Sentering without waste by dripping. Top to be floated smooth to receive composition roofing.

(Note: The thickness of concrete above the mesh of Self-Sentering to depend upon the strength of slab required. See Safe Load Tables.)

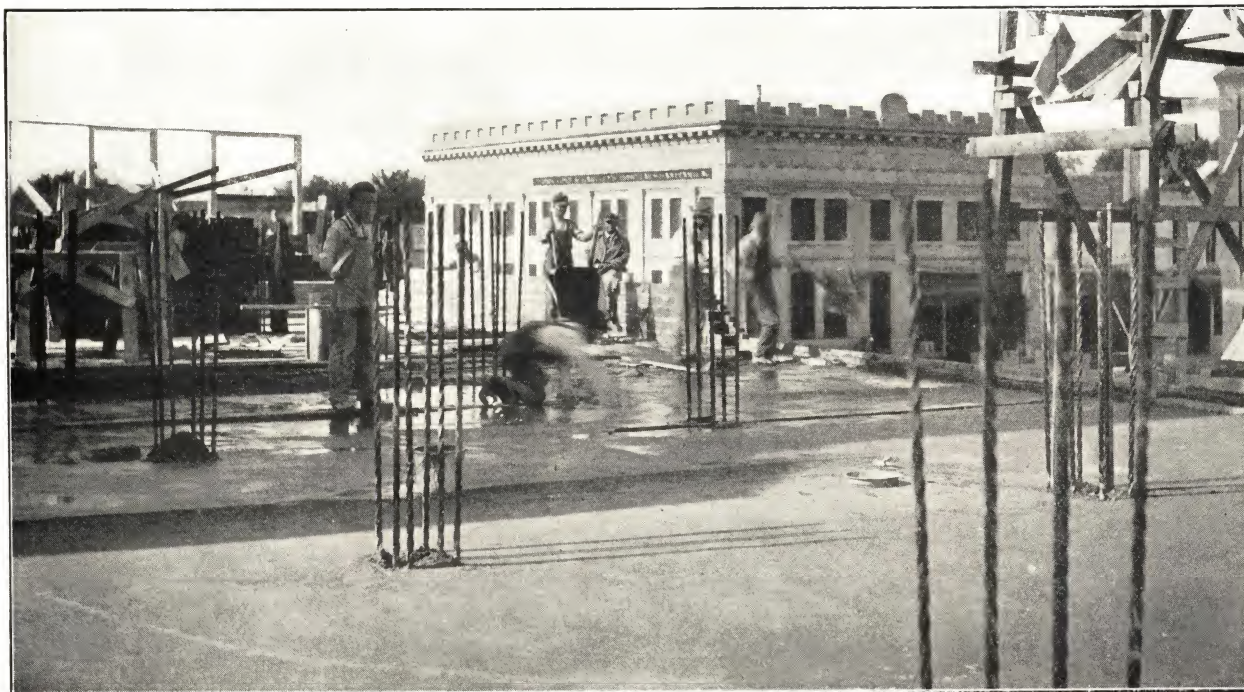
Concrete should be deposited over supports and spread towards center of span.

When the slab has thoroughly set, the underside shall be plastered with one coat of cement plaster to a thickness of $\frac{1}{2}$ -inch.

This coat consists of a mixture of one part Portland cement (gauged with 1-10 its volume of lime), $2\frac{1}{2}$ parts clean, sharp sand, with the addition of a small amount of hair to assist adhesion.



Self-Sentering Roof Ironton School, Ironton, Ohio



Self-Sentering Floor for Garage and Lodge Hall, Battle Creek, Iowa

Expansion Rods

(Note: Required on all roofs, recommended for floors as well.)

Round rods having a sectional area of about .03 square inches, shall be placed 30 inches on centers on top of the heavy ribs and at right angles to them to take up expansion. (Note: The manufacturers of Self-Sentering can furnish a special No. 5 rod .207 inches in diameter for this purpose.)

Roofing

(For Roofs.) After the concrete has set an approved brand of roofing is to be applied.

With Wood Beams

Where supporting members are of wood, suitable wire staples (1½-inch, No. 10-gauge, galvanized with a ¾-inch spread preferred) to be used to secure the Self-Sentering in position. Self-Sentering sheets to be stapled to supports not more than 7¼ inches apart, i. e., one staple to every other rib at each bearing point.

Sheets to be fastened together, concrete applied and underside plastered as on steel construction.

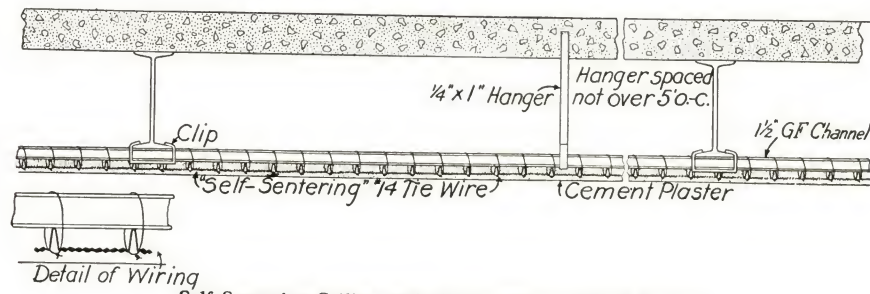
Mosaic or Terrazzo Floors Over Wooden Joists

Over wooden joists to be laid one layer of black, waterproof building paper; over this, 28-gauge Self-Sentering with ribs up and across the joists; on this to be placed 1½ inches of concrete to consist of one part Portland cement, two parts clean, sharp sand and four parts rock having a maximum dimension of ¾-inch. Concrete to be thoroughly mixed to a quaking or jelly-like consistency and applied. Wooden screeds 1½ inches thick are to be laid, so concrete can be screeded off to an accurate thickness and be made smooth and level, forming a base for tile, terrazzo, marble, etc.

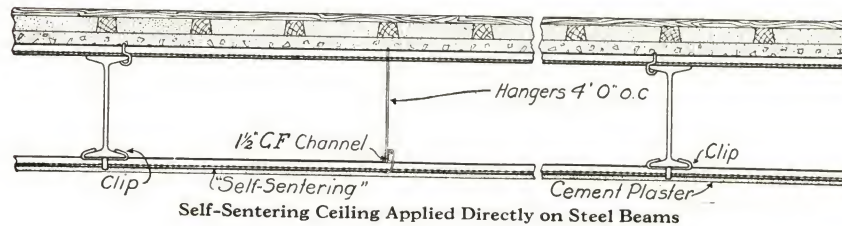
With Concrete Beams

Where concrete beams are used with flat slabs, the ends of the Self-Sentering sheets shall rest on edges of beam boxes, extending into the concrete beam approximately 2 inches. Sides of beam boxes may be wired together to save bracing. With arched slabs the ends of the Self-Sentering sheet shall rest on the bottom board of the beam box, and shall be lightly fastened to prevent displacement while pouring. In other respects the work shall be performed in the same manner as with structural steel framing.

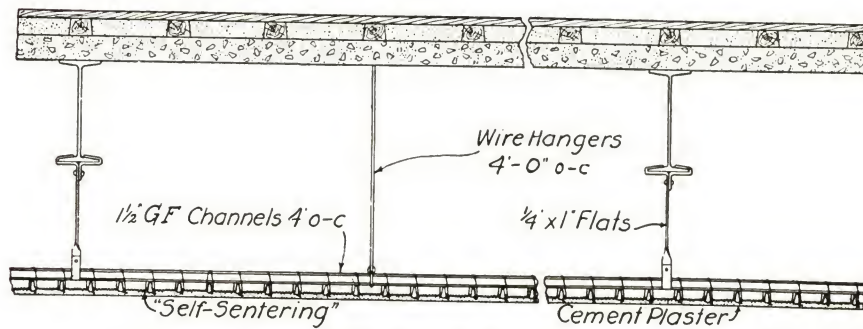
Details of Self-Sentering Ceilings



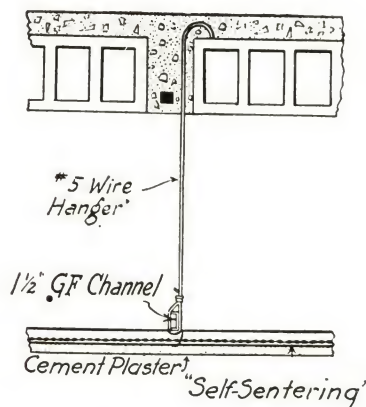
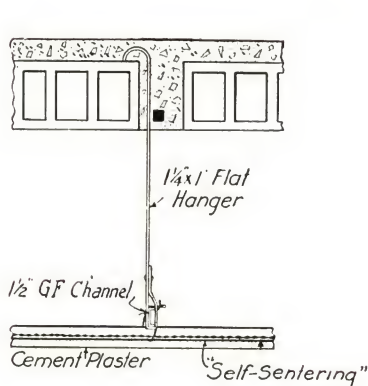
Self-Sentering Ceiling with GF Channels on Steel Beams



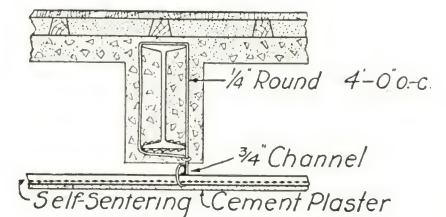
Self-Sentering Ceiling Applied Directly on Steel Beams



Self-Sentering Ceiling Suspended from Steel Beams and Concrete Slab



Methods of Hanging Self-Sentering Suspended Ceilings from Tile and Concrete Slabs



Self-Sentering Ceiling Suspended from Fireproof Steel Beams

Self-Sentering Ceilings and Specifications

FOR fireproof ceiling work, where suspended ceilings are required, or where beams or other supports are too far apart to permit the use of metal lath without cross furring, Self-Sentering offers an economical type of construction. In this capacity, it acts as both lath and furring, the heavy ribs taking the place of small channels or angles necessary with metal lath and the diamond mesh connecting fabric, forming a perfect plastering surface. The Self-Sentering is secured by clips or wiring to all beams or hangers at every other heavy rib, these supports being spaced from 3 to 5 feet on centers, depending on the gauge of Self-Sentering used. Due to the close spacing ($3\frac{5}{8}$ inches, center to center) of the Self-Sentering ribs, an unusually firm surface is afforded for the plaster and necessary strength is developed to support the ceiling load.

In addition to the added strength given to such a ceiling by reason of the closely spaced ribs, the saving in both time and material, effected by the elimination of all furring and the labor entailed in its application, is a very material consideration. The large sheets of Self-Sentering permit very rapid erection of such a ceiling, reducing the number of laps and cutting labor costs. Under circumstances as outlined above, this

is the simplest and most economical form of fireproof ceiling.

Ceiling Specifications

For all suspended ceilings, Self-Sentering shall be placed with lath surface down and attached to lines of support at every other rib, either by wiring with No. 14-gauge wire, or by special clips. Supports may be varied as to spacing from 3 to 5 feet, using

.56 lb. Self-Sentering for spans up to 4 feet.

.65 lb. Self-Sentering for spans up to 5 feet.

.75 lb. Self-Sentering for longer spans.

Supports to be hung from roof or floor slabs by $\frac{1}{4}$ x 1-inch flats or by $\frac{3}{8}$ -inch rounds. (The manufacturers of Self-Sentering can supply a special No. 5 Rod particularly for this purpose.) Supports (excepting regular floor beams), should be $1\frac{1}{2}$ -inch GF Channels.

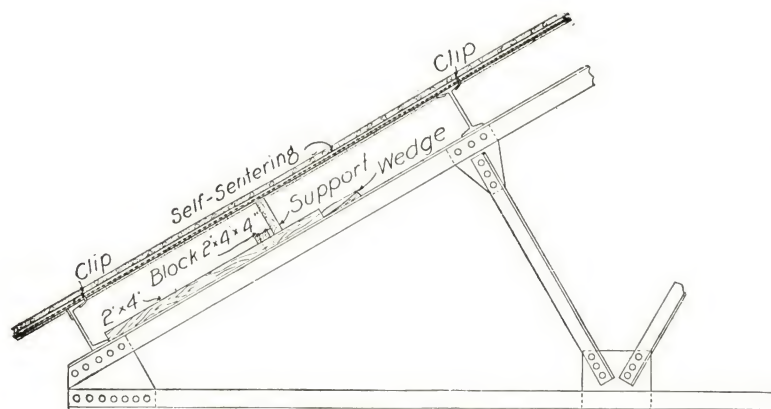
Sides and ends of adjoining sheets shall be securely interlocked and fastened every two feet along the sides and at every other rib on the ends by wiring. End laps over supports to be 2 inches and between supports 8 inches, the latter to be staggered if possible. As on metal lath ceilings, any type of plaster may be used, but it should contain double the amount of hair or fibre required for wood lath work.



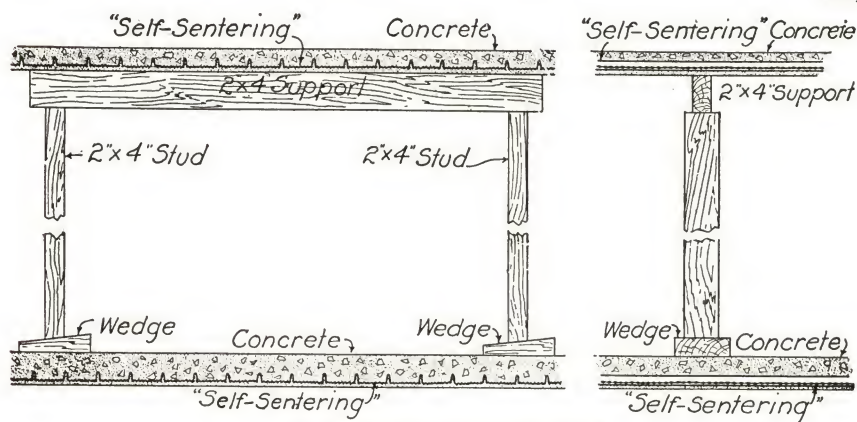
Union Station, Denver, Col. 42,756 sq. ft. No. 24 ga. Armco Ingot Iron Self-Sentering used. Architects, Gove & Walsh, Denver. Contractors, General—Stocker & Fraser, Denver. Plasterer, Anthony Hobson, Denver.

Methods of Erecting Temporary Supports Required on Long Spans

Where spans between trusses are too long to be spanned by 2-inch x 4-inch supports shown, intermediate supports may be placed between purlins, resting on the lower flanges or supported by wires.



Temporary Supports on a Pitched Roof



Temporary Supports on Flat Roof

This method of erecting supports, where story height is not too great, will often be found simpler and more economical to erect than by attaching supports to purlins and trusses.



Extreme Simplicity of Erecting Temporary Supports on Long Spans

GF Expanded Metal



Expanded Metal, from the very nature of the material itself, gives a most uniform distribution of the steel. However unskilled the workman, or however rapidly the work is being done, the fact that all that is necessary is to lay the sheets in place with ends and sides lapping one diamond, makes errors practically impossible. No care need be used in spacing reinforcement and no danger that pouring the concrete may displace the steel. The diamond shaped mesh gives continuity of reinforcement, diffused stresses from concentrated loads over wide areas, eliminating the necessity for cross reinforcement.

Expanded Metal Styles, Weights and Standard Size Sheets

How to Order Expanded Metal

In ordering Expanded Metal, the following points should be taken into consideration:

The effective sectional area and weight desired, the size of mesh (the dimensions of meshes are always referred to by the cross width), the length and width of sheets.

The length of the sheet runs the long way of the diamond and unless otherwise specified, the first dimensions given will be taken as the length. Thus an order for sheets 10 feet by 5 feet would be filled with sheets 10 feet in length and 5 feet in width.

With the exception of dimensions, these points are cared for by our style numbers, but in case none of the styles meet requirements the information above asked for will be sufficient to furnish what is wanted.

Style	Approx. Weight Per Sq. Ft. in Pounds	Deliveries	Standard Size Sheets	
			Lengths	Widths
			Long Way of Diamond	Short Way of Diamond
3-10-176 3-10-265 3-10-353	.60 .90 1.20	Carried in Stock in Standard Sheets	6', 8', 9', 10'-8"	3', 4', 5', 6'
			6', 8', 9', 10'-8"	4', 5'-4"
			6', 8', 9', 10'-8"	3', 4', 6'
3-12-150 1 1/2-12-194 3/4-12-246	.51 .66 .84		6', 8', 9', 10'-8"	4', 5'
			6', 8'	3', 4', 6'
			6', 8'	4'-4", 6'-6"
3-10-324 3-10-25 3-10-20	1.10 .85 .68	Five Days to Two Weeks Dependent on Size Order and Unfilled Business on Books	6', 8', 9', 10'-8"	4'-4"
			6', 8', 9', 10'-8"	5'-8"
			6', 8', 9', 10'-8"	5'-3"
3-10-162 3-10-15 3-12-125	.55 .51 .425		6', 8', 9', 10'-8"	3', 4', 5', 6'
			6', 8', 9', 10'-8"	4'-4", 6'-6"
3-12-10 3-16-082 3-16-059	.34 .278 .20		6', 8', 9', 10'-8"	4', 6'-4"
			6', 8', 10'-8"	3', 4', 5', 6'
			6', 8', 10'-8"	4', 5'-4"
2 1/4-12-164 2 1/4-16-118 2 1/4-16-10	.56 .40 .34		6', 8', 10'-6"	4', 5'
			6', 8', 10'-6"	3', 4', 6'
			6', 8', 10'-6"	4', 5'
2-12-161 2-16-103 1 1/2-12-181	.547 .351 .61		6', 8'	4', 5'
			6', 8'	4', 5'
			6', 8'	4'-3"
1 1/2-16-105 1 1/2-18-088 1-12-234	.36 .308 .796		6', 8'	4', 5'
			6', 8'	3', 4', 6'
			6', 8'	4', 5'
1-16-175 1-18-125 3/4-16-154	.597 .425 .525		6', 8'	3', 4', 6'
			6', 8'	4'-4"
			6', 8'	3', 4', 6'
3/4-18-147 1/2-18-220	.50 .75		6', 8'	3'-8"
			6', 8'	4'

Note—Interpret styles as follows: For example 3-10-176. 3 equals short dimension of Diamond in inches; 10 equals approximate gauge; 176 equals .176 square inches sectional area per foot of width.

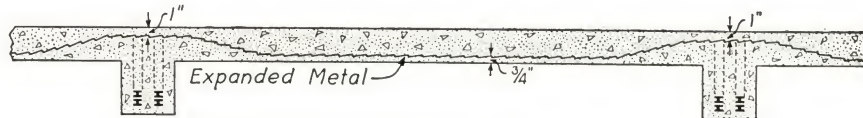
GF Expanded Metal Slab Tables

The tables below give the *safe live load*, in pounds per square foot, for stone concrete slabs, reinforced with different weights of *Expanded Metal*, on spans ranging from four feet to twelve feet by steps of six inches, and for slabs varying in thickness by half-inches from three inches to eight inches.

Above each table is noted the style of *Expanded Metal* upon which the table is based. The sectional area of the reinforcement per foot of width, and the weight of the reinforcement per square foot, are found by reference to the table on page 51.

The stresses figured for the steel in tension, and concrete in compression and in shear, are indicated above the tables. The concrete is considered in these tables as offering no tensile resistance.

All of the tables are based upon reinforcement three-quarters of an inch above the bottom of the slab at the point of greatest moment, and bending it up to within one inch of the top of the slab over the supports. Sketch "A" shows the location of the reinforcement.



SKETCH "A" LOCATION OF EXPANDED METAL REINFORCEMENT

Stress of Steel in Tension, 16,000 lbs. per sq. in.
Extreme Fibre Stress of Concrete in Compression 800 lbs. per sq. in.
Concrete in Shear, not over 60 lbs. per sq. in.
Ratio of Moduli of Elasticity taken as 15.
Straight Line Formula.

Bending Moment = $\frac{1}{2} WL$.

(a) For BM = $\frac{1}{2} WL$ add dead weight of slab to safe live load given below; multiply the sum by .83 and subtract the dead weight to obtain the new safe live load.

(b) For BM = $\frac{1}{8} WL$ proceed as in (a) multiplying by .67 instead of .83.

Slab Table No. 1 — Safe Live Loads — Style 3-12-150 or 3-10-150 Expanded Metal

Slab	Span																
	4' 0"	4' 6"	5' 0"	5' 6"	6' 0"	6' 6"	7' 0"	7' 6"	8' 0"	8' 6"	9' 0"	9' 6"	10' 0"	10' 6"	11' 0"	11' 6"	12' 0"
3"	264	200	156	122	97	78	62	49									
3 1/2"	329	250	196	154	123	99	79	63	51	40							
4"	393	300	235	185	148	119	96	77	62	50	39	30	23				
4 1/2"	457	349	273	216	173	140	113	91	74	59	47	37	28	20			
5"	521	396	311	246	197	159	129	105	85	68	54	43	33	24			
5 1/2"	585	447	351	278	223	180	147	121	97	78	63	49	38	29	20		
6"	648	495	389	308	248	201	163	133	108	87	70	56	43	33	23		
6 1/2"	712	546	428	340	273	221	180	147	120	97	78	63	49	37	26		
7"	780	598	470	372	300	244	199	162	132	108	87	69	54	42	30	21	
7 1/2"	845	646	508	403	325	264	215	176	144	117	94	76	60	46	33	23	
8"	909	696	547	434	350	285	232	190	155	126	102	82	65	50	37	26	

Slab Table No. 2 — Safe Live Loads — Style 3-10-176 Expanded Metal

Slab	Span																
	4' 0"	4' 6"	5' 0"	5' 6"	6' 0"	6' 6"	7' 0"	7' 6"	8' 0"	8' 6"	9' 0"	9' 6"	10' 0"	10' 6"	11' 0"	11' 6"	12' 0'
3"	313	240	188	148	119	96	78	63									
3½"	390	298	234	186	150	121	99	81	66	53							
4"	468	359	282	224	181	147	120	98	81	66	54	44	35				
4½"	540	417	327	261	210	172	140	115	95	78	63	51	41	32	25		
5"	618	475	374	298	241	197	161	133	110	90	74	60	49	38	30	22	
5½"	692	532	418	334	270	221	181	150	123	101	83	68	56	44	34	26	
6"	764	588	464	370	300	245	201	166	137	113	93	76	62	50	39	29	
6½"	852	657	517	415	336	274	226	187	154	128	105	87	71	57	45	35	25
7"	926	715	564	451	366	299	246	204	169	140	115	95	78	63	50	38	28
7½"	1005	774	610	488	396	324	267	221	184	152	126	104	85	69	55	43	32
8"	1089	839	661	529	430	352	290	241	200	166	138	113	93	76	61	47	35

Slab Table No. 3 — Safe Live Loads — Style 3-10-265 Expanded Metal

Slab	Span																
	4' 0"	4' 6"	5' 0"	5' 6"	6' 0"	6' 6"	7' 0"	7' 6"	8' 0"	8' 6"	9' 0"	9' 6"	10' 0"	10' 6"	11' 0"	11' 6"	12' 0"
3'	477	368	293	235	192	159	132	110									
3½"	593	459	365	294	240	199	166	139	117	100							
4"	709	548	436	352	288	238	200	167	141	119	101	86	73				
4½"	826	639	509	411	337	279	234	197	166	141	120	102	87	74	63		
5"	945	732	583	471	386	320	268	226	191	163	138	118	101	86	73	62	52
5½"	1062	823	656	530	435	361	302	255	216	184	157	134	115	98	83	70	59
6"	1179	914	729	589	484	402	336	284	241	205	175	150	128	110	94	79	67
6½"	1295	1004	800	647	532	442	370	312	265	226	193	166	142	121	104	88	75
7"	1411	1095	872	705	580	482	404	341	290	247	211	182	155	133	114	97	82
7½"	1528	1185	945	764	629	523	438	370	314	268	230	198	169	145	124	106	90
8"	1644	1275	1017	823	677	563	472	399	339	289	248	213	183	157	134	115	97

Slab Table No. 4 — Safe Live Loads — Style 3-10-353 Expanded Metal

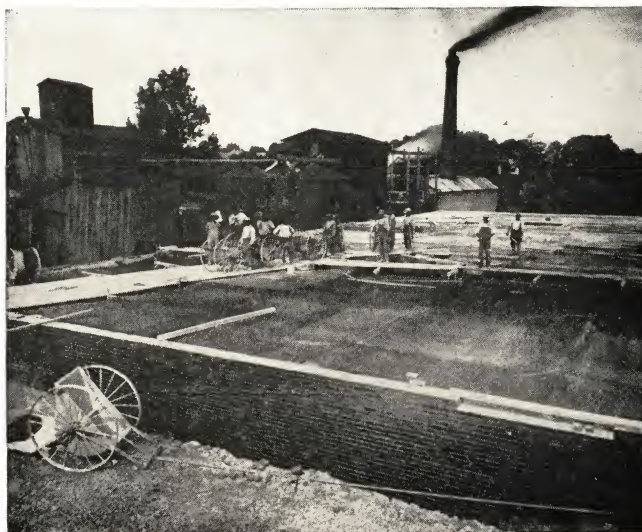
Slab	Span															
	4' 0"	4' 6"	5' 0"	5' 6"	6' 0"	6' 6"	7' 0"	7' 6"	8' 0"	8' 6"	9' 0"	9' 6"	10' 0"	10' 6"	11' 0"	12' 0"
3"																
3 1/2"	790	614	491	397	328	273	230	195	166	142						
4"	946	735	588	477	394	328	277	234	200	172	148	129	111			
4 1/2"	1104	858	687	557	460	384	324	275	235	202	174	152	131	114	99	
5"	1260	979	784	636	526	439	371	314	270	232	200	175	151	132	114	86
5 1/2"	1416	1103	883	717	593	495	418	355	305	262	227	198	171	150	130	114
6"	1573	1226	982	796	659	551	465	396	340	293	253	221	191	167	146	128
6 1/2"	1732	1349	1082	878	726	607	513	437	374	323	279	244	211	185	161	142
7"	1892	1473	1182	960	794	662	561	478	410	354	306	267	232	204	177	156
7 1/2"	2053	1600	1283	1043	864	723	611	520	446	385	333	291	253	222	194	168
8"	2214	1724	1383	1124	930	778	658	560	481	415	359	314	273	240	209	184

Expanded Metal Floors

In concrete floors, the peculiar advantages of expanded metal reinforcement have special value. The varying conditions of loading, from the severe shock of heavy falling bodies to the massive uniform load, are all provided for by the action of the expanded metal under stress. The strains from concentrated loads are diffused over wide areas by the diagonal strands of the mesh. The sheets of expanded metal made up of diagonal strands also permit the cutting of holes for circular stairs, flues, pipes or belts in floors without materially weakening the slab because the continuous network of steel will carry the stresses around the opening.

Expanded metal floors may be used economically on any reasonable spans, though short spans with light slabs are usually preferable. As a general rule, the mix for the concrete should be one part Portland cement, two parts clean sand, and four parts crushed stone or gravel. For long spans and heavy loads, stone, gravel or slag concrete should be used, but for ordinary purposes, cinder concrete (using good clean anthracite cinders where available) is amply strong and is about one-third lighter.

The types of floors shown below have all been used successfully under varying conditions, and these designs used in connection with the slab tables given on pages 52 and 53, can be adapted to any type of building.



Jas. E. Roades Bldg., Hillsboro, Ohio. Expanded Metal Floor.
F. M. Woodford, Architect

TYPE "A"

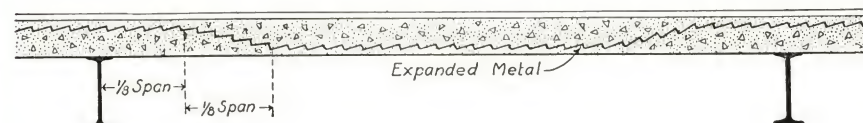
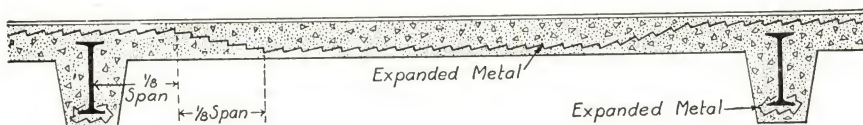
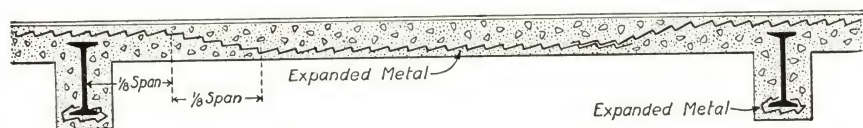
This is the most common type of expanded metal floor — beams fireproofed with 2 inches of concrete and slab extending about 2 inches above the beam. Expanded metal is raised over the beams to care for negative stresses.

TYPE "B"

This type is very similar to type "A", the only difference being the shape of the fireproofed beams. Forms are a little more costly than the preceding style, but for appearance sake this style is often preferred.

TYPE "C"

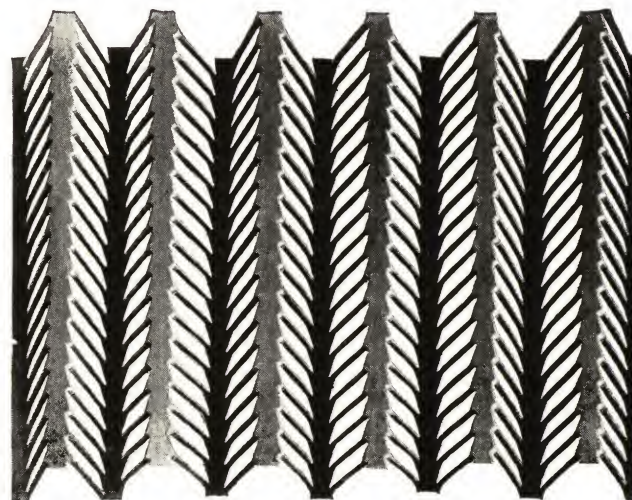
This type of floor is often used where the beams are to be protected by a suspended ceiling of metal lath and plaster. Forms are built flush with the top of the steel beam, and the slab resting entirely on the beam is absolutely continuous.



TRUSSIT

A Reinforcement for Walls and Partitions

TRUSSIT is a corrugated expanded steel sheet, for reinforcing and forming fireproof walls and partitions. The chief advantages for Trussit as a reinforcement of this kind are that it eliminates entirely the use of studding and makes possible the erection of partitions but 2 inches in thickness, space-saving, shock-proof and fire-resistant; curtain walls equal to brick or poured concrete at practically half their cost. Trussit is expanded uniformly in both directions, giving a wall equal strength from either side. It is so interwoven back and forth through the cement or plaster that it is not a mere backing for the wall but it is an integral part of it. This uniform distribution of the metal also overcomes any tendency toward cracking of the wall through expansion or contraction in any direction due to changes of temperature.



Trussit Data

SHEETS are 19 inches wide. Trussit is shipped from factory warehouse stock in lengths of 8, 10 and 12 feet, not carried in Duluth stock. Intermediate lengths when required will be cut from the next longer sheet and waste charged to customer. No charge for cutting.

Trussit is always packed 10 sheets to the bundle. Furnished in either Steel, Armco Iron or Galvanized. (See below). No unpainted material.

Trussit is furnished in the following weights per square foot: 57 lbs., 62 lbs. and 83 lbs.

Trussit cut from galvanized or Armco sheets furnished on mill shipment of 5 tons minimum of one length and weight only.

Solid Partitions of Trussit or Self-Sentering

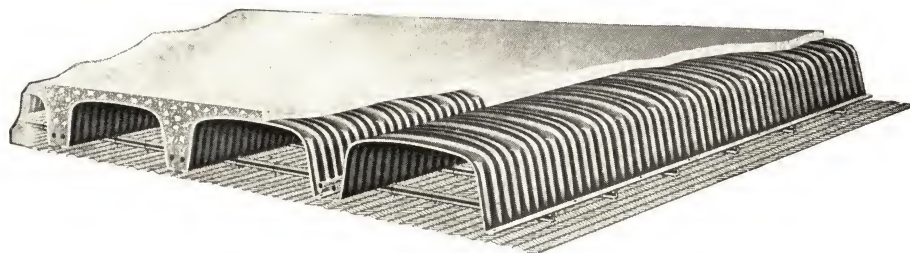
TRUSSIT or Self-Sentering is the basis of solid partitions, erected without studding. These partitions show maximum strength and rigidity with minimum weight, embody simplicity of construction by eliminating studding and have a wide range of adaptability for all classes of buildings.

Trussit and Self-Sentering are especially suitable for solid partitions in hospitals, schools, apartments, storerooms, office buildings, warehouses, and factories; also extensively used for elevator and air shafts.

The use of Trussit or Self-Sentering in solid partition construction gives a wall 2 inches thick, or slightly more for extended heights, constructed without studding of any character, yet making an absolutely fireproof plastered partition. Statistics from large conflagrations show that solid partitions are of the most durable type, even when exposed to intense heat.

The space-saving features of such a partition cannot be overestimated. When compared with the ordinary 6-inch partition, a Trussit or Self-Sentering partition means a saving of one square foot of floor space to every three lineal feet of partition. In warehouses, storage buildings and hospitals, these thin partitions give maximum usable floor space.

GF Steel-Tile



Steel-Tile Floor Construction with GF Channels and Herringbone Metal Lath for Ceiling

GF Steel-Tile are steel forms for concrete floors designed on the T-beam principle — deep and narrow reinforced joists with a thin slab of concrete between.

The economy of this type of construction, particularly for long span work is very apparent and includes savings throughout the entire structure in which Steel-Tile floors are used. Light weight floors permit lighter beams and girders, columns, foundation and footings.

Savings of material and labor, reduction in amount of form work required, speedy construction — all are secured by the use of GF Steel-Tile.

Ceiling construction with GF Channels and Herringbone Rigid Metal Lath is shown at top of page. Ceilings are flat, floors comparatively thin, making story height less without loss of headroom.



GF End-Tile

GF Steel-Tile are made of 26-gauge steel, heavily corrugated, width 20"; height 4", 6", 8", 10", 12" and 14". Intermediate sections made in 30" and



GF Steel-Tile

35" lengths. End caps furnished to match from 28-gauge steel.

Single and Double Tapered Tile for increasing the width and thickness of concrete at intersection of joist and beam are also furnished.

Ask for the Steel-Tile Handbook, complete with tables, formulas and specifications of Steel-Tile Floors and concrete work in general.



Public School No. 54. Architect, Board of Education. General Contractors, Nugent Construction Corporation, New York City

GF Steel Lumber

GF Steel Lumber, a shop fabricated material of known integrity and strength offers for light occupancy buildings, hotels, apartments, office buildings, public buildings and residences a means of true building economy.

Its installation follows the simplest possible design for fire-safe construction. GF Steel Floor joists are handled and laid in the same manner as ordinary wood joists. After laying GF Diamond Rib or Herringbone Metal Lath is attached to the top and bottom flanges acting as a combined form and reinforcement for the floor slab and as lath and reinforcement for the ceiling plaster. Wood floor can be applied if desired. See details on next page.

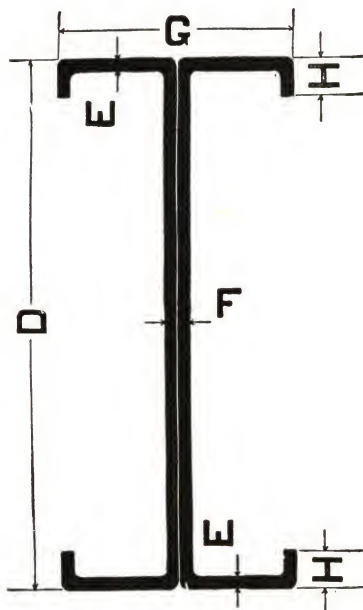
This construction eliminates all combustible materials, and gives the lightest fire resistive floor construction possible.

GF Steel Lumber Floors cost little more than combustible wood floors—All sections are shipped cut to size and ready to place in position and are just as convenient to handle as wood joists.

Employing a flat concrete slab of minimum thickness, GF Steel Lumber Floors reduce materially the quantity of concrete required by other types of floor design.

In inclement weather and notably in cold climates, work can proceed without interruption or hazard which would delay other types of fire resistive construction.

Properties of GF Steel Joists



Depth	Wt. per Foot	Area of Sect.	Thickness of Metal		Width of Flanges		Moment of Iner.	Section Modulus	Depth
			E	F	G	H			
In.	Lbs.	Sq. In.	In.	In.	In.	In.	I	S	In.
4"	3.7	1.08	.072	.144	3	1½	2.60	1.30	4"
5"	4.2	1.22	.072	.144	3	1½	4.38	1.75	5"
6"	4.7	1.38	.072	.144	3	1½	6.90	2.30	6"
7"	5.5	1.62	.072	.144	3½	5⁄8	11.20	3.20	7"
8"	6.1	1.80	.072	.144	4	5⁄8	16.80	4.20	8"
9"	7.0	2.06	.075	.150	4	¾	23.85	5.30	9"
10"	8.0	2.35	.078	.156	4½	¾	33.25	6.65	10"
11"	9.5	2.80	.086	.172	4½	¾	46.20	8.40	11"
12"	10.5	3.10	.090	.180	4½	¾	60.00	10.00	12"

For convenience in identification and specifying, sections are designated by their depth and weight, i. e.,

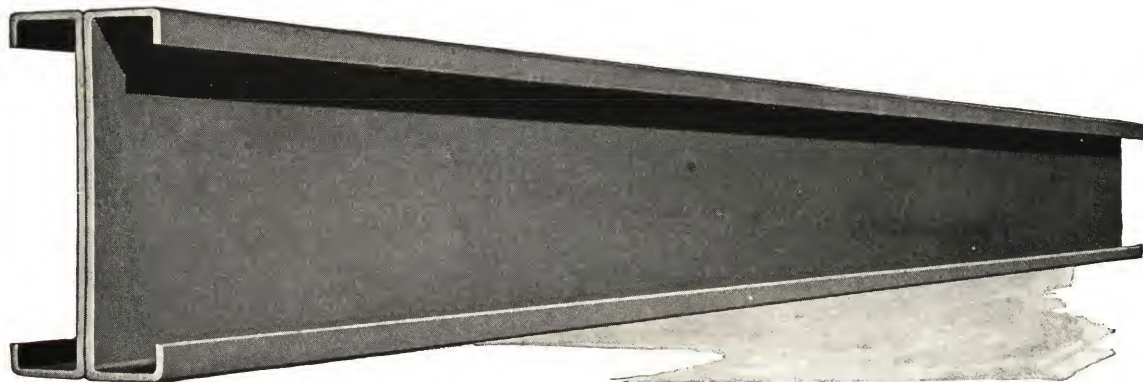
10"—8 lb. I

Sections are furnished only on catalog weights and to an allowable variation of 2½% from published weights.

GF Steel Lumber reduces the dead load on all structural supporting members of the building—This effects true economy of material and labor from the footings to the roof.

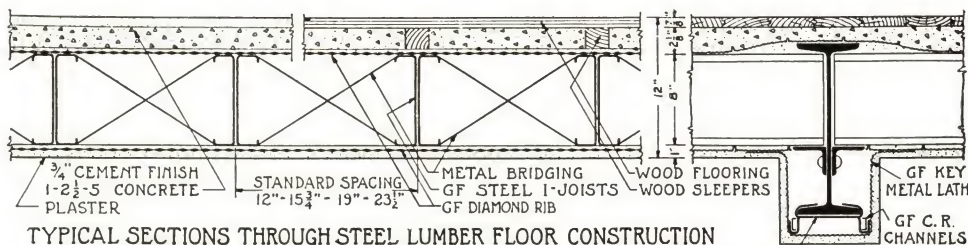
A GF Steel Lumber Floor is approximately 50% lighter in dead weight than any other type of Fire-Safe Construction of equal strength.

All sections can be furnished in maximum shipping lengths eliminating all splicing.



GF Steel Lumber --- Construction Details

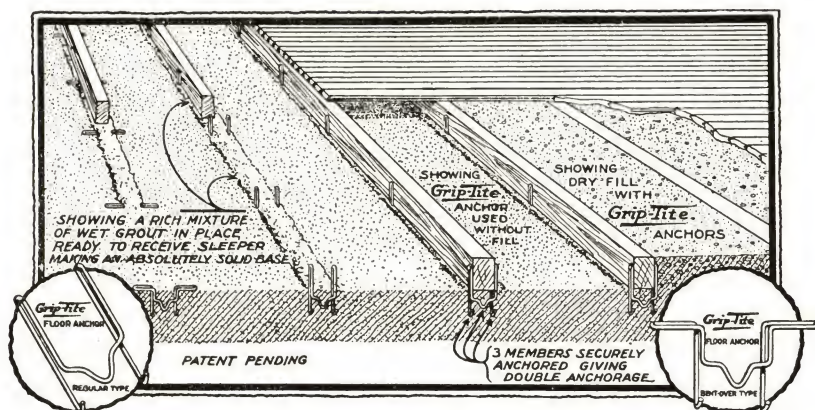
This cross section shows the details of the standard GF Steel Joist Floor construction with various floor finishes. The steel floor reinforcement is placed on top of the joists and fastened securely to same by using large headed roofing nails or spring wire lath clips. In case of a wood finish floor a nailing strip is placed on top of the lath reinforcement and secured to the joist. Concrete is then placed on top as shown. Ceiling lath is fastened to the bottom of the joists by using spring wire lath clips not more than 9 inches on centers. The standard construction for a first class fire-safe floor calls for a $\frac{7}{8}$ " thickness of plaster underneath the steel joists.



TYPICAL SECTIONS THROUGH STEEL LUMBER FLOOR CONSTRUCTION

Architects & Engineers—We have for distribution a 12 page booklet (8½x11 size to fit your files) dealing exclusively with Steel Lumber construction. A copy will be gladly furnished on request.

Grip-Tite Floor Anchors



Also furnished in Special Design for Veneer Work or Furring

The Anchor With the Three Strong Lion's - Paw Grips

The dead load is reduced 18,000 pounds per 1000 sq. ft. of floor area as no fill is required. Therefore less structural steel. A dry air space is provided which prevents sleepers from rotting and provides for laying pipes and conduits.

Sleepers and flooring can be laid at the same time and with this anchorage there can be no possibility of squeaky floors.

These anchors are now on duty in hundreds of the best buildings in the United States and we have many very high recommendations from users all over the country. They say that Grip-Tite Anchors save 37%.

Reliable - Durable - Strong - Economical

You save at least \$32.00 per 1,000 sq. ft. of floor area by eliminating the concrete fill and even tho a fill is required, a dry fill may be used and still have a substantial saving.

Are made of No. 9 gauge Dead Soft Annealed Galvanized wire that will last for ages. Special nails are furnished with all anchors.

You will find that these anchors are the solution of the difficult sleeper proposition where you have wood floors over concrete.

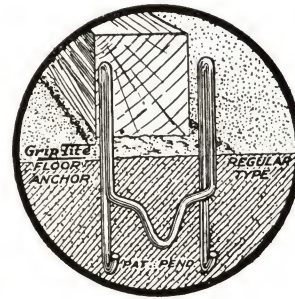
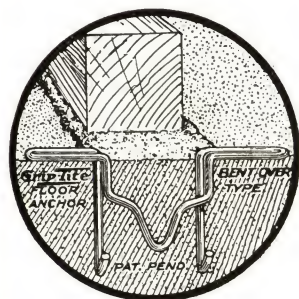
GRIP-TITE Floor Anchors are furnished for 2 in., 3 in., or 4 in., sleepers, either regular type or with ears bent over (see illustration).

Packed in Cartons—500 or 1000 anchors in a carton (including nails). The special nails furnished with Grip-Tite anchors will be of great convenience as well as quite a saving and you always have them on the job when you need them.

In ordering always state width of anchors required.

Shipping weight of GRIP-TITES 85 to 110 lbs., per M including nails.

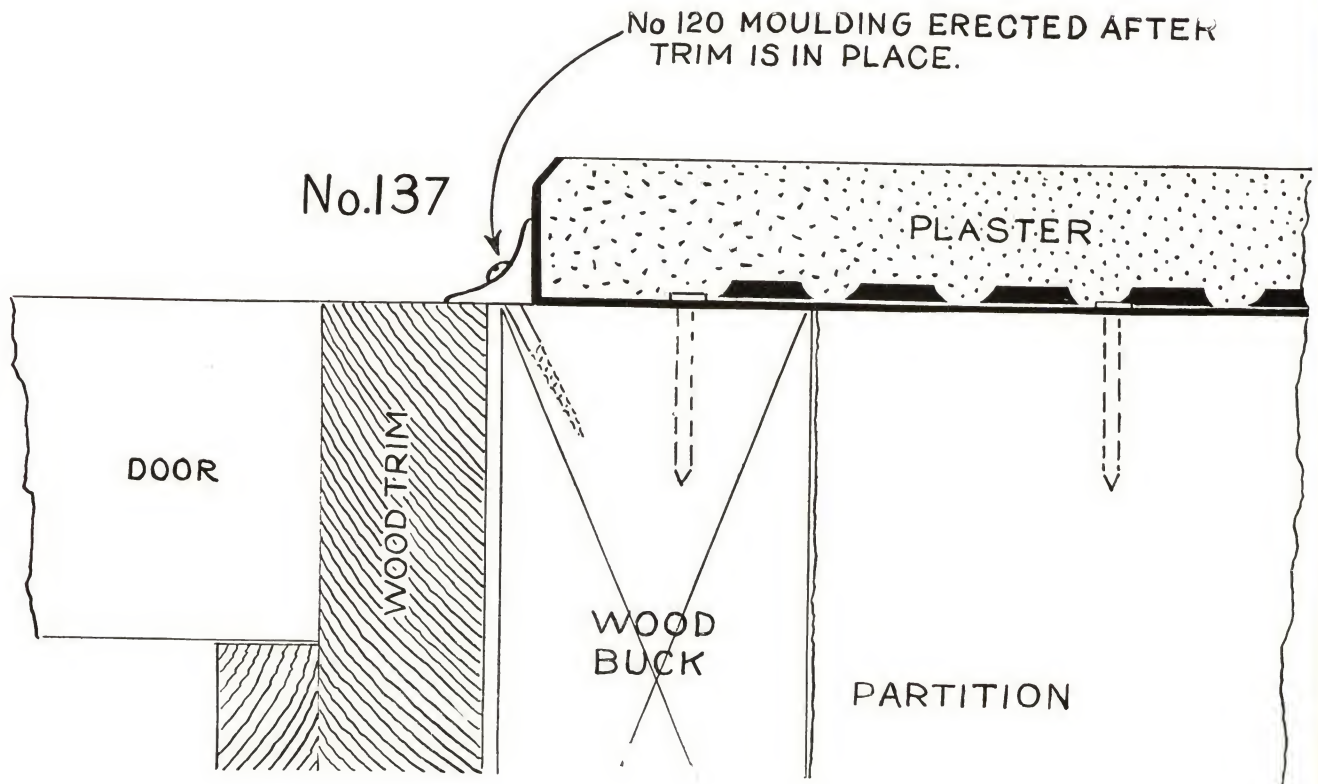
Carried in Duluth Stock. Ask for circulars completely illustrating various sizes and types.



Sanitary Door and Window Casing

Richsto No. 137 Casing and No. 120 Moulding

(Patent applied for)



Full Size

No. 137 Casing Made of 20 Gauge Special Tight coated Galvanized Sheet Steel.
Extra Long Nailing Flange.
Mitreing to order at small additional cost.
Tools for Mitreing furnished when desired.
Crater Cone shaped perforations form a perfect plaster key.

Grounds $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ".

Stock Lengths 6', 7', 7'4", 8', 9', 10'.

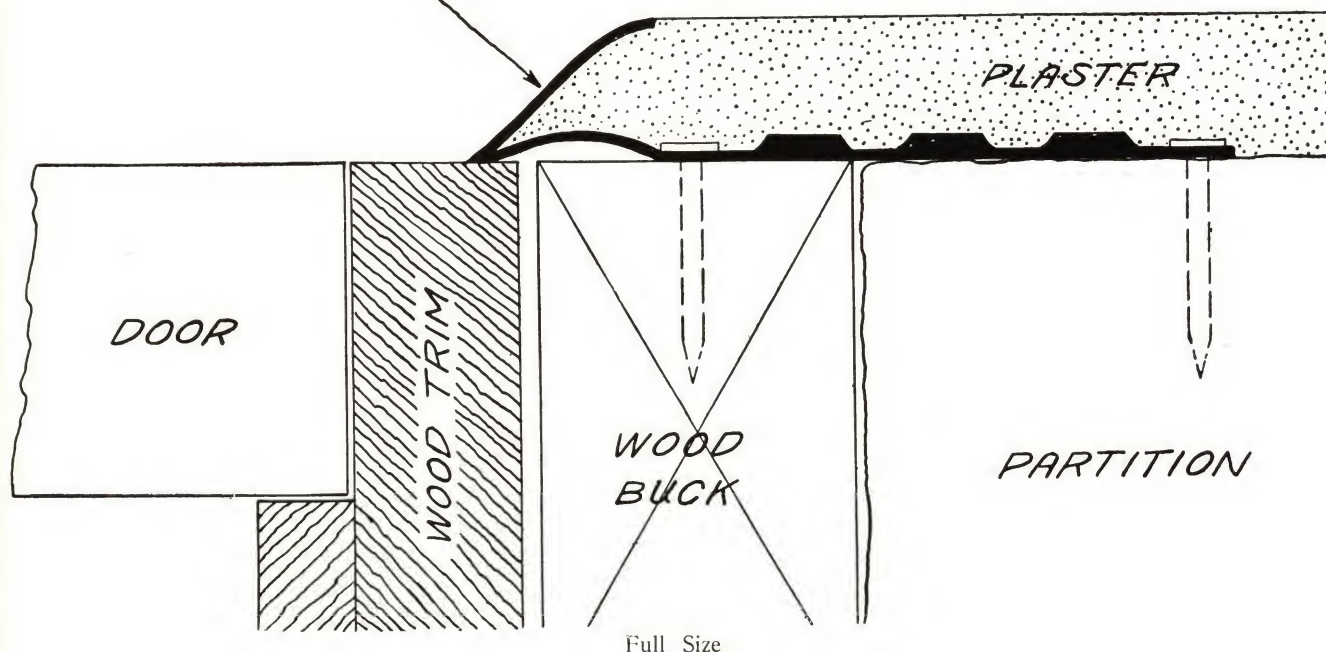
Weight approximately 600 pounds per M feet crated.

No. 120 Moulding is recommended for use in connection with this Casing. Made of 20 gauge metal and will not bulge on sides. Oval or flat head screws furnished without extra charge. All exposed surfaces primed with our special primer.

Sanitary Door and Window Casing

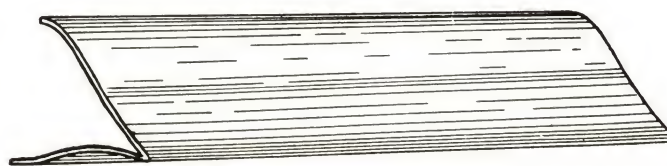
Richsto No. 139 and 140 (Patent applied for)

RICHSTO CASING No. 140



No. 140 Casing Made of 24 gauge Special Tight coated Galvanized Sheet Steel.
Nailing Flange 4 inches long.
Mitreing will be done at factory on order at small additional cost.
Tools for mitreing furnished when desired.
Crater cone shaped perforations form a perfect plaster key.

RICHSTO CASING No. 139



Grounds $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ".

Stock Lengths 6', 7', 7'4", 8', 9', 10'.

Weight approximately 470 pounds per M feet crated.

This casing is applied after wood trim is in place and does not require extra moulding.

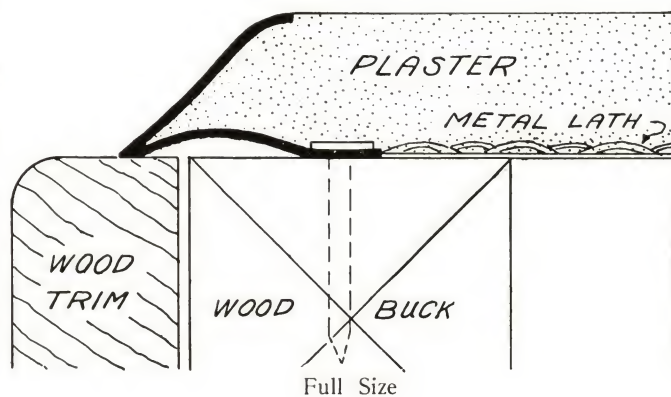
No. 139 Casing is identically the same as No. 140 except that it has the short nailing flange.

Made of 24 gauge Galvanized Steel.

Grounds $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ".

Weight approximately 285 pounds per M feet crated.

Stock Lengths 6', 7', 7'4", 8', 9', 10'.

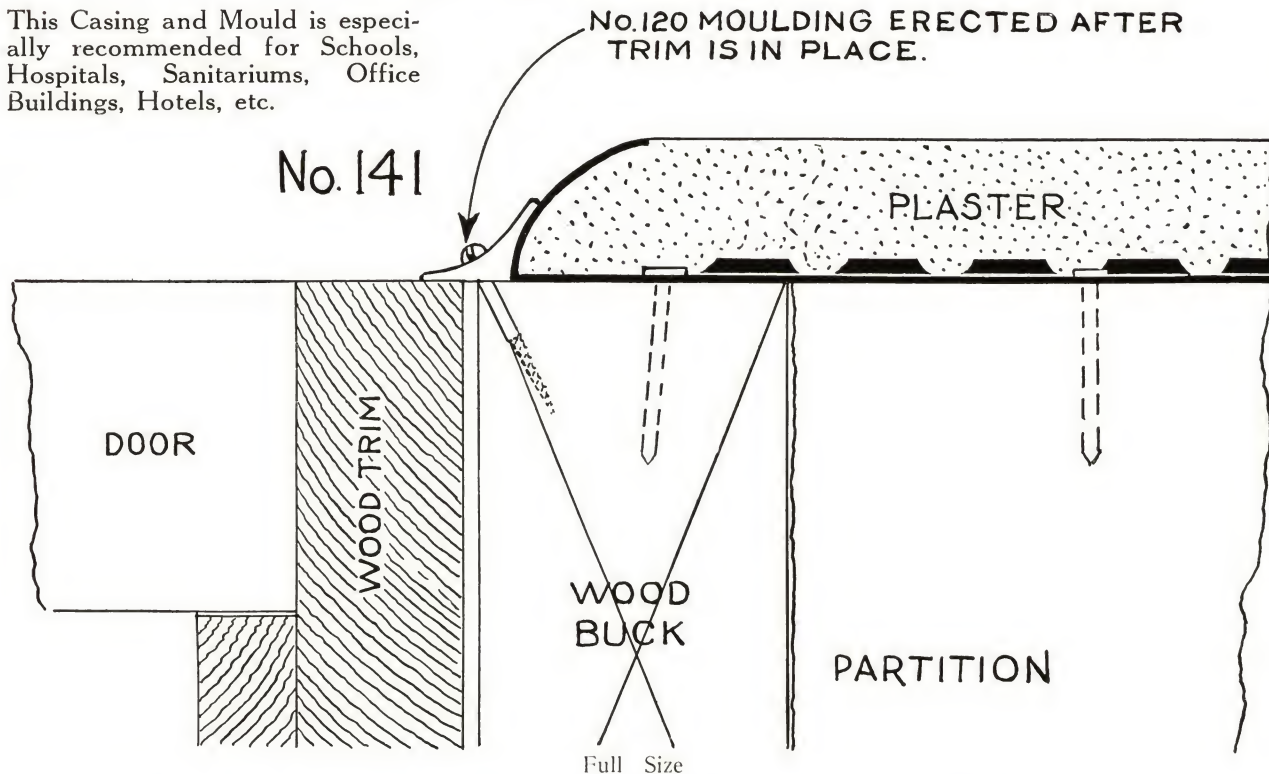


Sanitary Door and Window Casing

Richsto No. 138 and 141 Casing and No. 120 Moulding (Patent applied for)

When used in connection with our No. 110 or No. 112 Base
a perfectly Sanitary installation is assured

This Casing and Mould is especially recommended for Schools, Hospitals, Sanitariums, Office Buildings, Hotels, etc.



No. 141 Casing Made of 20 Gauge Special Tight coated Galvanized Sheet Steel.

Grounds $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ".

Weight approximately 620 pounds per M feet crated.

Stock Lengths 6', 7', 7'4", 8', 9', 10'.

Nailing flange 4 inches long.

All exposed surfaces are primed with our special primer.

Our improved crater cone perforations form a perfect key.

We are equipped to mitre Casings to order at small additional cost.

Tools for mitreing Casings furnished at reasonable rental when desired.

We furnish either Oval or Flat Head Screws for Mould without extra charge.

No 138 Casing is identically the same as No. 141 except that it has the short nailing flange.

Made of 20 gauge Galvanized Steel.

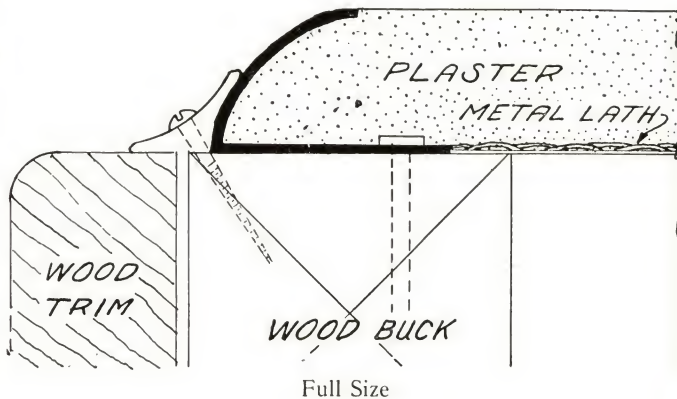
Grounds $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ ".

Weight approximately 310 lbs. per M feet crated.

Stock Lengths 6', 7', 7'4", 8', 9', 10'.

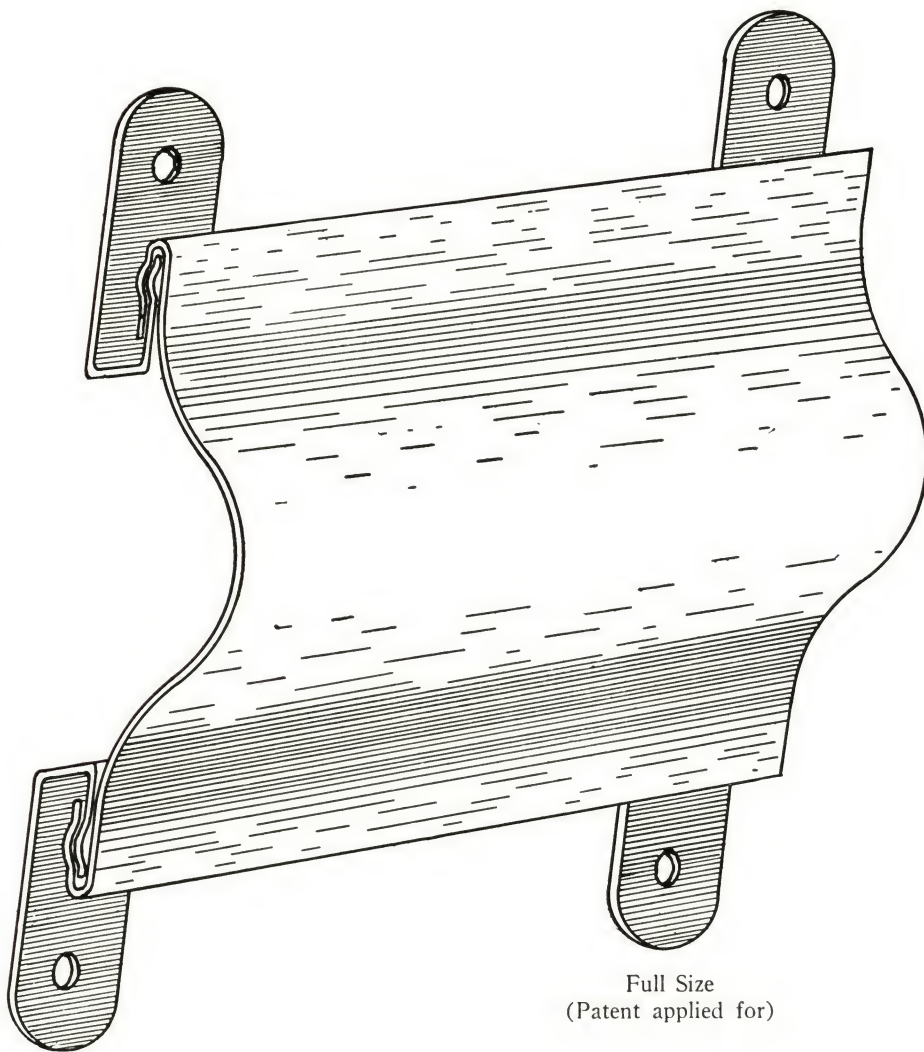
No. 120 Moulding is recommended for use in connection with this casing. Made of 20 gauge metal.

RICHSTO CASING No. 138

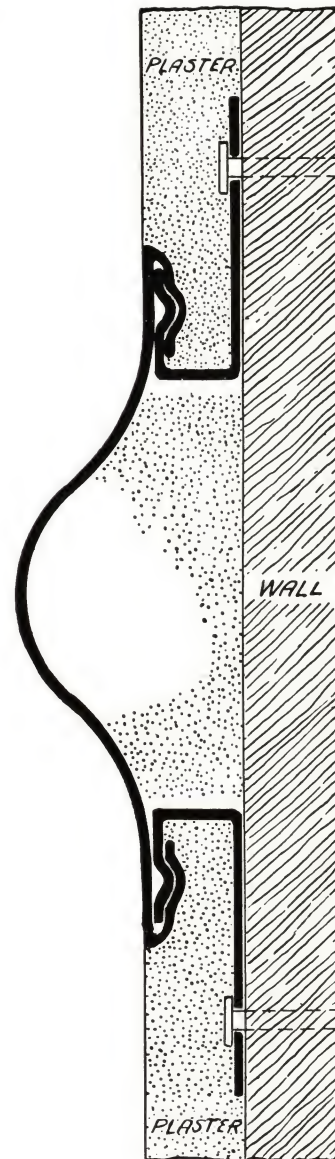


Metal Chair Rail

*RICHSTO CHAIR RAIL
NO. 130*



Full Size
(Patent applied for)



The No. 130 Chair Rail also employs our sliding bracket arrangement for attachment. This makes it possible to nail at convenient points on about 12 inch centers and leaves ample openings for quick and easy grouting after erection.

Made of 20 gauge Special Tight Coated Galvanized Steel.

Stock lengths 10 feet. Special lengths to order.

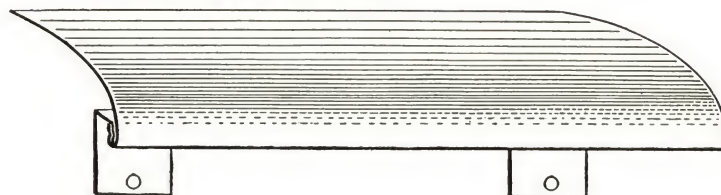
Weight approximately 710 pounds per M feet crated.

Our end stops which return the chair rail to finished wall surface should be used at the ends of each run.

Right end stop is No. 130A. Left end stop is No. 130B.

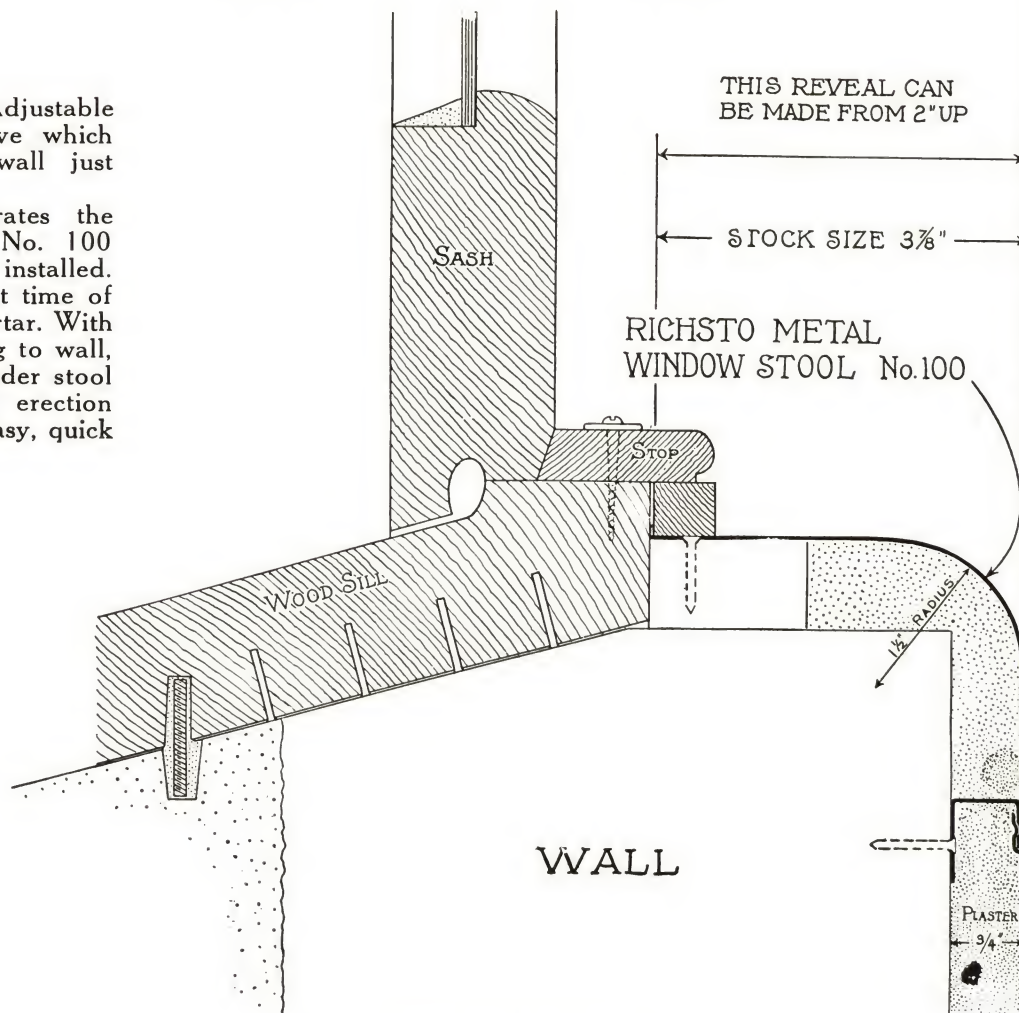
Metal Window Stool

No. 100 Richsto (Curved)
(Patent Applied For)



Special Feature. Adjustable bracket slides in groove which permits fastening to wall just where desired.

This drawing illustrates the manner in which our No. 100 Stool is designed to be installed. Stool should be filled at time of setting with Cement Mortar. With our method of attaching to wall, Mortar can be filled under stool on the Wall side after erection thus accomplishing an easy, quick and perfect installation.



About Half Actual Size

No. 100 Curved Metal Window Stool. Made of 18 or 20 Gauge Special tight coated Galvanized Sheet Steel.

Stock Reveal. $3\frac{7}{8}$ " Standard but can be furnished in any size from 2" up.

Lengths to 10 feet without splice. Over 10 feet spliced without extra charge.

Stool furnished in $\frac{1}{2}$ ", $\frac{5}{8}$ " or $\frac{3}{4}$ " Grounds as desired.

All exposed surfaces primed with our special primer.

Weight 18 gauge, $3\frac{7}{8}$ " reveal, approximately 1153 pounds per M feet crated.

Weight 20 gauge, $3\frac{7}{8}$ " reveal, approximately 903 pounds per M feet crated.

For Fireproof Construction loop anchors attached to under side of Stool for use in cement grout.

Metal Window Stool

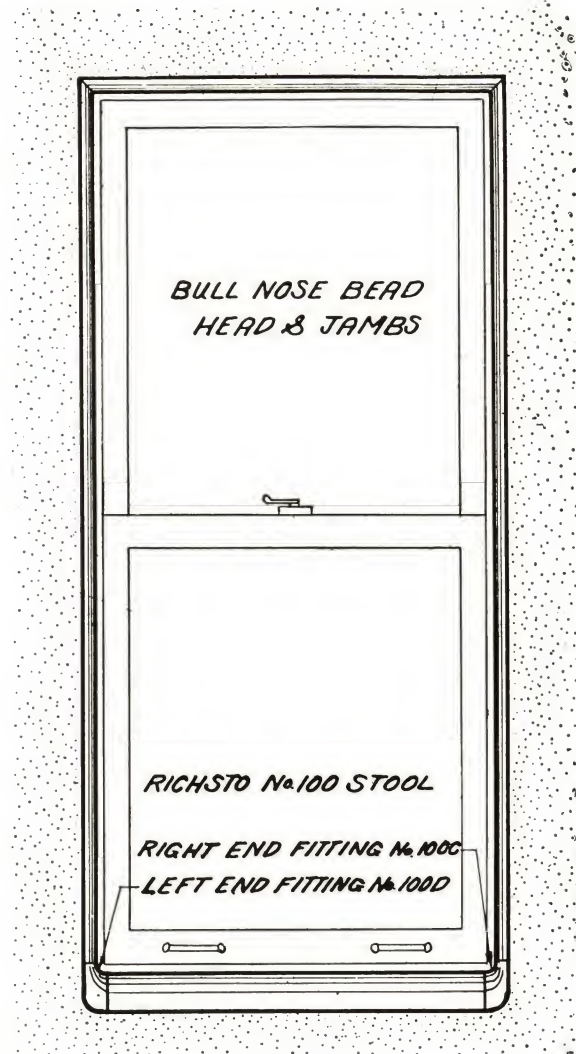
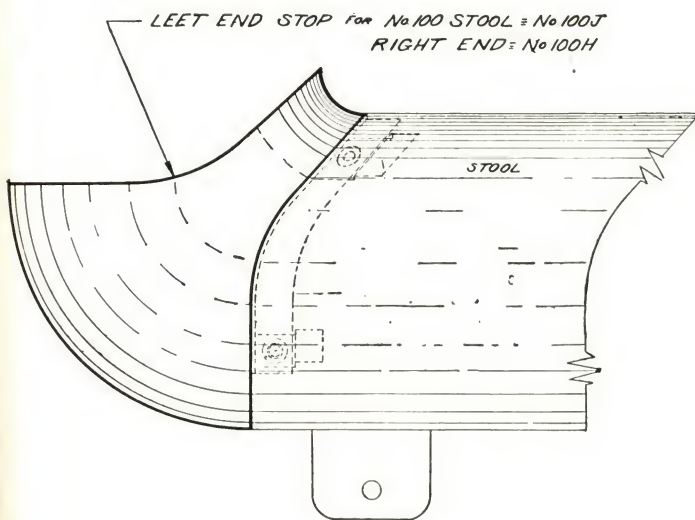
Details applying in connection with No. 100 Curved Stool

This illustration shows our No. 100 stool used in connection with Bull Nose Bead head and jambs which makes a first class installation at reasonable cost. The corners between stool and jambs are made neat and trim with our special fitting for this purpose. The corners between head and jambs are formed by mitreing the Bull Nose Bead. Either of the $\frac{3}{4}$ " or $1\frac{1}{2}$ " radius Bull Nose Beads may be used for this purpose.

The Richsto metal window stools make an inexpensive, fireproof, sanitary, and durable installation.

As a general rule we recommend 18 gauge metal for stools with a reveal wider than $3\frac{7}{8}$ " or when stool is longer than 5 feet.

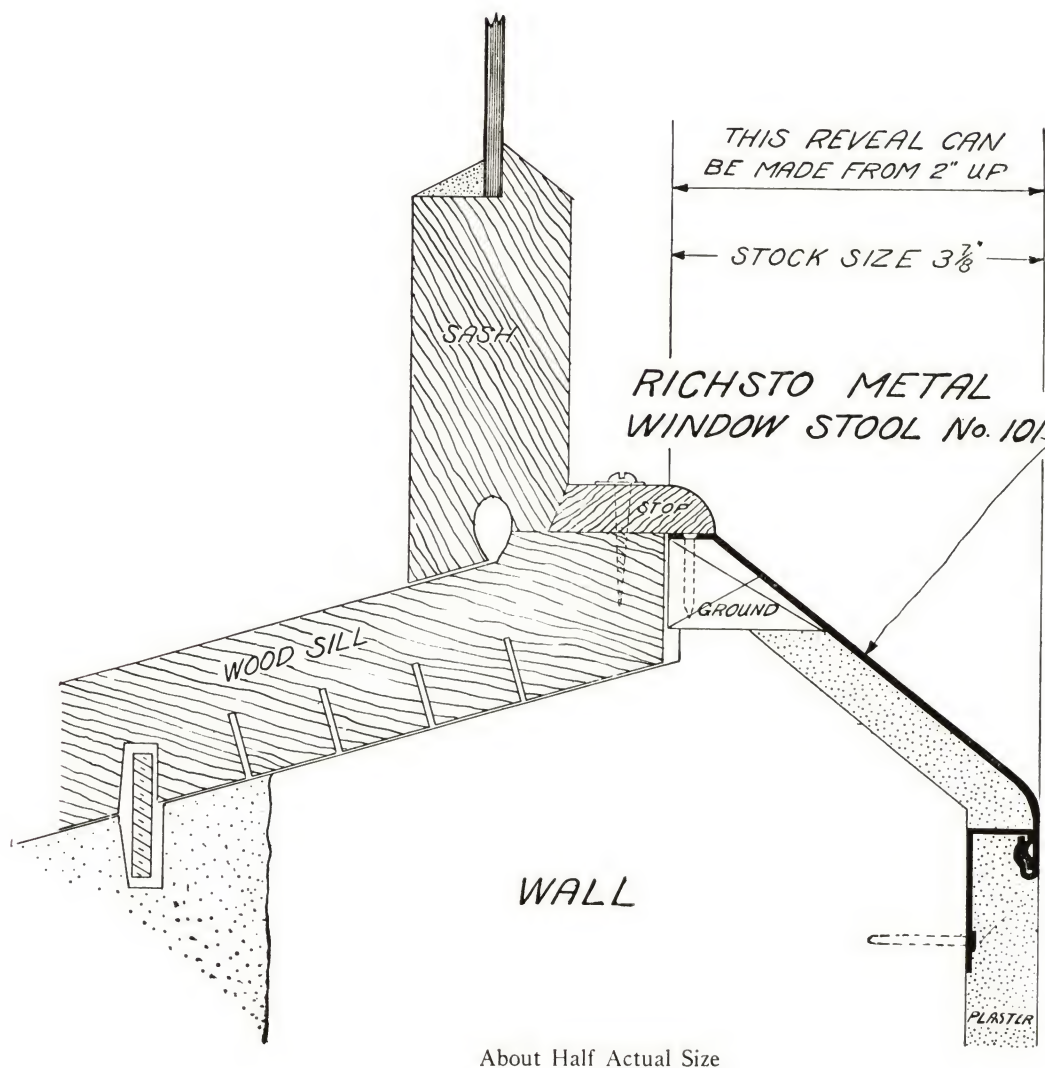
These stools are cut to length, necessary fittings attached, crated, and shipped ready to set in place.



These end stops are used when the No. 100 stool and plaster head and jambs are desired. They form a clean cut and pleasing connection between the stool and jambs.

Splay Metal Window Stool

Richsto No. 101 (Patent applied for)



About Half Actual Size

No. 101 Splay Window Stool is made of 18 or 20 gauge Special Tight Coated Galvanized Steel.

Stock Reveal $3\frac{7}{8}$ " standard but can be furnished in any size from 2" up.

Lengths to 10 feet without splice. Over 10 feet spliced without extra charge.

Stool furnished in $\frac{1}{2}$ ", $\frac{5}{8}$ ", or $\frac{3}{4}$ " grounds as desired.

Weight 18 gauge $3\frac{7}{8}$ " reveal, approximately 1535 pounds per M feet crated.

20 gauge $3\frac{7}{8}$ " reveal, approximately 1150 pounds per M feet crated.

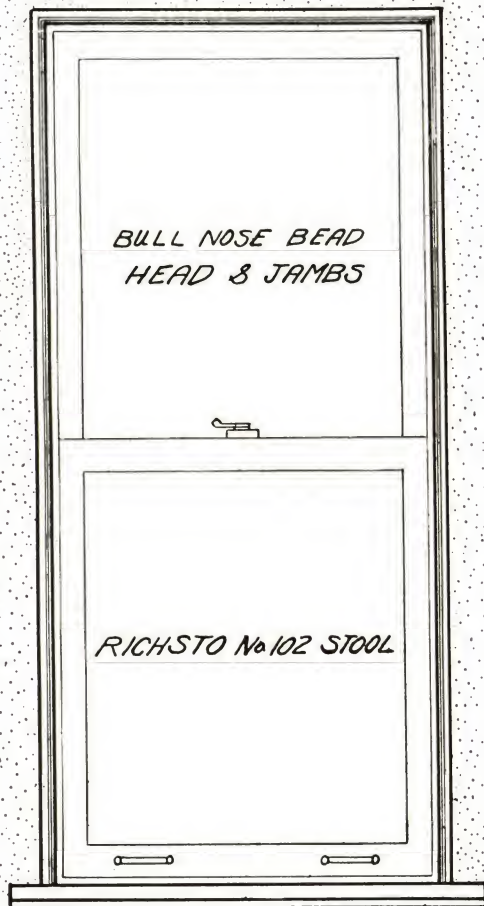
Special Feature: Adjustable bracket slides in groove which permits fastening to wall just where desired.

The above illustration shows the manner in which this stool should be installed.

Used where general splay effect is desired.

Flat Metal Window Stool

Richsto No. 102 (Patent applied for)



No. 102 Flat Window Stool. Made of 18 or 20 Gauge Special tight coated Galvanized Sheet Steel.

Stock Reveal. $3\frac{7}{8}$ " Standard but can be furnished in any size from 2" up.

Lengths to 10 feet without splice. Over 10 feet spliced without extra charge.

Stool Furnished in $\frac{1}{2}$ ", $\frac{5}{8}$ ", $\frac{3}{4}$ " Grounds as desired.

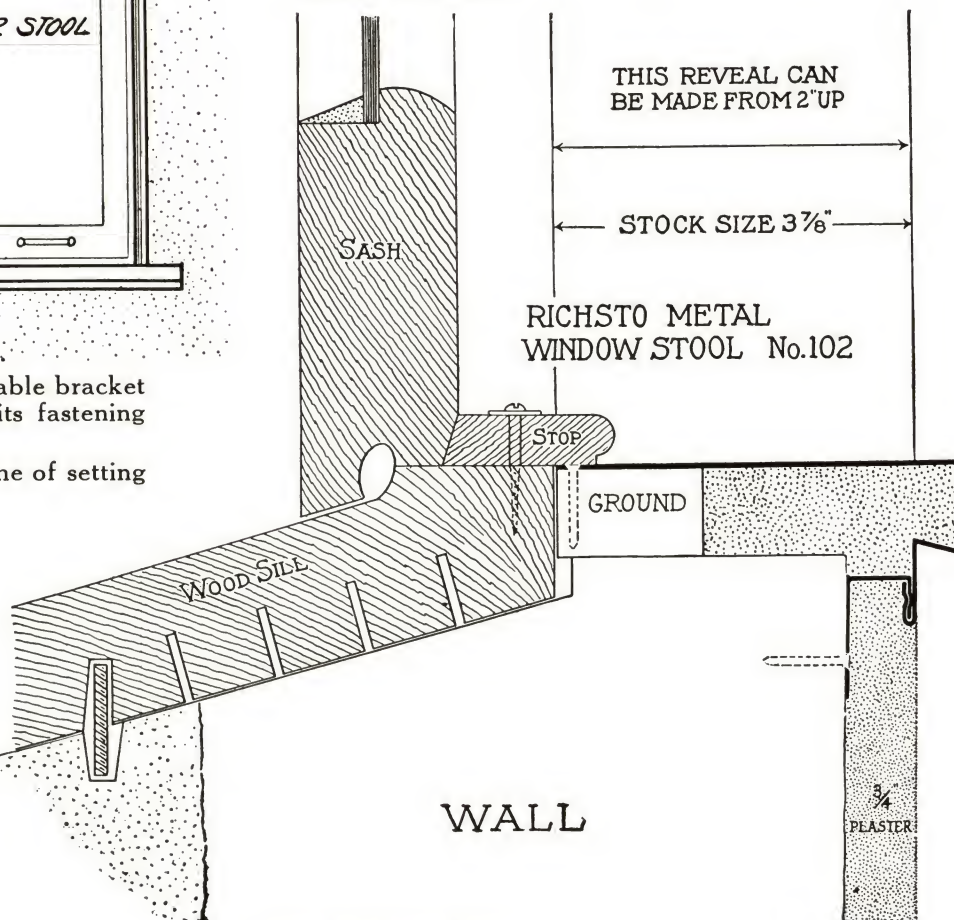
Weight 18 gauge, $3\frac{7}{8}$ " reveal, approximately 1332 pounds per M feet crated.

20 gauge, $3\frac{7}{8}$ " reveal, approximately 1040 pounds per M feet crated.

Closures for ends furnished without extra charge.

All exposed surfaces primed with our special primer.

We here show the effect of our No. 102 Stool with Bull Nose Bead, head and jambs. This makes an ideal trim for window openings of this design. No fittings are used for this arrangement, the jambs resting on the flat surface of the stool and mitred to fit the head. This stool projects $\frac{3}{4}$ " out from the wall line and $1\frac{1}{2}$ " beyond the finished jamb. These ends are fitted with steel stops at the factory.



Special Features. Adjustable bracket slides in groove which permits fastening to wall just where desired.

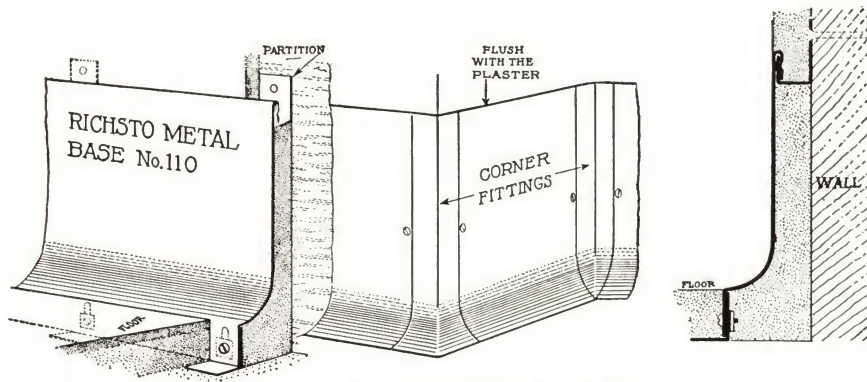
Stool should be filled at time of setting with cement mortar. With our method of attaching to wall, mortar can be filled under stool on the wall side after erection thus accomplishing an easy, quick, and perfect installation.

This cut illustrates the manner in which our No. 102 Flat Stool is designed to be installed.

Where Flat Stool is desired this makes a very good substantial installation.

About Half Actual Size

Metal Cove Base



About One-Third Actual Size

No. 110 RICHSTO Flush Metal Cove Base

(Patent Applied For)

Made of 18 or 20 Gauge Special tight coated Galvanized Sheet Steel.

Used in connection with Cement Composition or Wood Floors.

No. 110 Base made in 10 foot lengths. Special lengths to order. Height four and six inches.

All fittings are simple to attach by use of machine screws which we furnish.

Necessary tools for erection of Base rented at nominal charge when ordered.

Detailed instructions furnished the contractor for properly installing Base.

The exposed surface of Base is primed with our special primer which gives a flat finish suitable for any type of decorative finish.

Our Method of attaching Base to construction permits of grouting Base in back after erection without use of grouting can or buttering of mortar on back before erection, thus accomplishing an easy, quick and perfect installation.

Special Features. Adjustable bracket, slides in groove making it easy to fasten to construction just where desired. Also slot feature to allow for settling of floors, thus preventing crack in wall at top of Base.

SUGGESTED SPECIFICATIONS FOR NO. 110 BASE

At the intersection of floors and walls throughout building, unless otherwise specified, use Richsto Manufacturing Co., No. 110 Base 4" high (or 6" high) 20 gauge (or 18 gauge) shall be used.

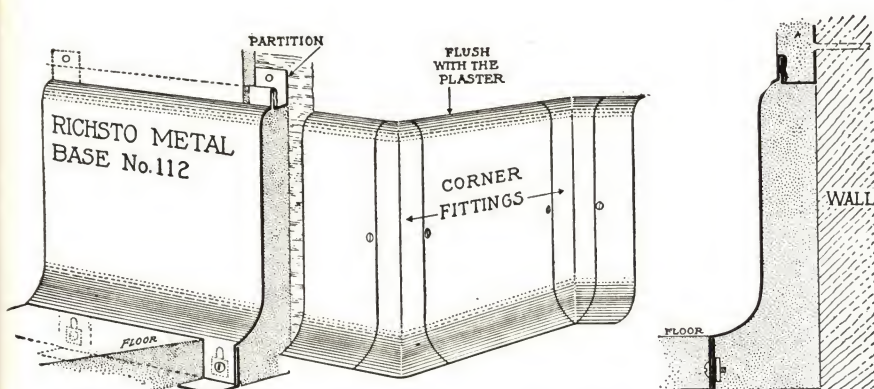
All inside and outside corners shall be supplied with $\frac{3}{4}$ " radius corner fittings attached to base by concealed bolts. At all door openings provide plinths corresponding to casing used and at other terminating points provide end stops.

Base shall be set before plastering to form a ground for the plaster and finished floor and shall be made straight and level by blocking out wherever necessary to compensate for irregularities in the floor and wall. Top and bottom of base shall be securely nailed at about 12" intervals.

Base shall be sawed to proper lengths on the job and proper fittings attached as per instructions of manufacturer.

Base shall be protected against damage during building and all plastered droppings or other foreign matter removed upon completion of plastering and floor work.

Metal Cove Base



About One-third Actual Size

No. 112

RICHSTO Metal Cove Base

(Patent Applied For)

Same as No. 110 Base
except that top of Base
has a convex Mould.

WEIGHTS

No. 110, 4", 18 gauge.....	Approximately 1055 pounds per M feet crated.
No. 110, 4", 20 gauge.....	Approximately 826 pounds per M feet crated.
No. 110, 6", 18 gauge.....	Approximately 1397 pounds per M feet crated.
No. 110, 6", 20 gauge	Approximately 1135 pounds per M feet crated.
No. 112, 4", 18 gauge.....	Approximately 1275 pounds per M feet crated.
No. 112, 4", 20 gauge	Approximately 990 pounds per M feet crated.
No. 112, 6", 18 gauge.....	Approximately 1585 pounds per M feet crated.
No. 112, 6", 20 gauge.....	Approximately 1350 pounds per M feet crated.

Standard Fittings for Metal Cove Base and Their Corresponding Numbers

	No. 110		No. 112	
	4" high	6" high	4" high	6" high
Inside square corner.....	110A	110A6	112A	112A6
Outside square corner.....	110B	110B6	112B	112B6
Inside round corner $\frac{3}{4}$ " radius	110C	110C6	112C	112C6
Inside round corner $1\frac{1}{2}$ " radius	110D	110D6	112D	112D6
Outside round corner $\frac{3}{4}$ " radius	110E	110E6	112E	112E6
Outside round corner $1\frac{1}{2}$ " radius	110F	110F6	112F	112F6
Right end stop	110H	110H6	112H	112H6
Left end stop	110J	110J6	112J	112J6
Right plinth for No. 137 casing	110K	110K6	112K	112K6
Left plinth for No. 137 casing	110L	110L6	112L	112L6
Right plinth for No. 138 and No. 141 casing	110M	110M6	112M	112M6
Left plinth for No. 138 and No. 141 casing	110N	110N6	112N	112N6
Right plinth for No. 139 and No. 140 casing	110P	110P6	112P	112P6
Left plinth for No. 139 and No. 140 casing	110R	110R6	112R	112R6
Right plinth block $4\frac{1}{4}$ " wide	110S	110S6		
Left plinth block $4\frac{1}{4}$ " wide	110T	110T6		
Right plinth block $5\frac{1}{4}$ " wide	110U	110U6		
Left plinth block $5\frac{1}{4}$ " wide	110V	110V6		

Removable Metal Base

Richsto No. 116 -- (Patent applied for)

Our No. 116 Base, as here shown is of the removable type. It is applied after the plaster and flooring and requires a wooden plaster ground for attachment. It is equipped with a continuous metal backing strip giving it an even and firm support at the point of attachment.

Only one ground is required on both the 4 in. and 6 in. base.

Furnished in 20 gauge Special Tight Coated Galvanized Sheet Steel.

Height 4 in. and 6 in.

Stock length 10 feet. Special lengths to order.

Weight 4 inch approximately 875 pounds per M feet crated.

Weight 6 in. approximately 1080 pounds per M feet crated.

Necessary tools rented for erection when desired.

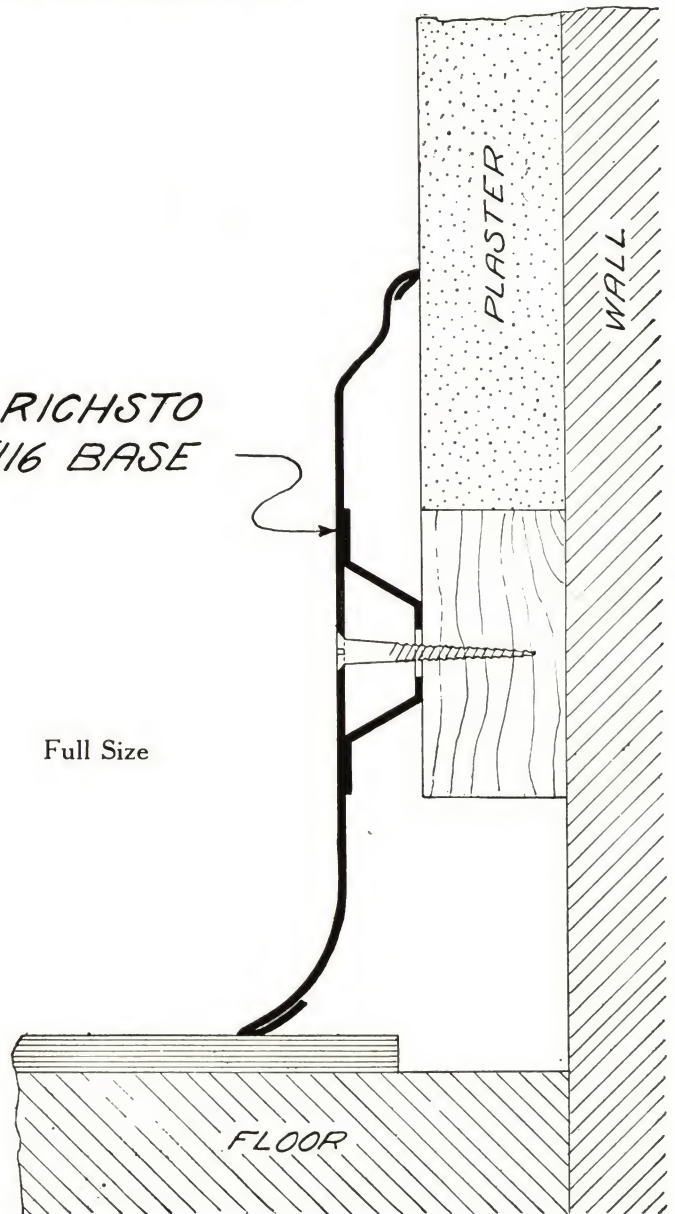
Fittings simple to attach by use of machine screws which we furnish.

Detail instructions for proper erection furnished contractor.

The exposed surface of base is primed with our special primer which gives a flat finish suitable for any type of decorative work.

*RICHSTO
#116 BASE*

Full Size

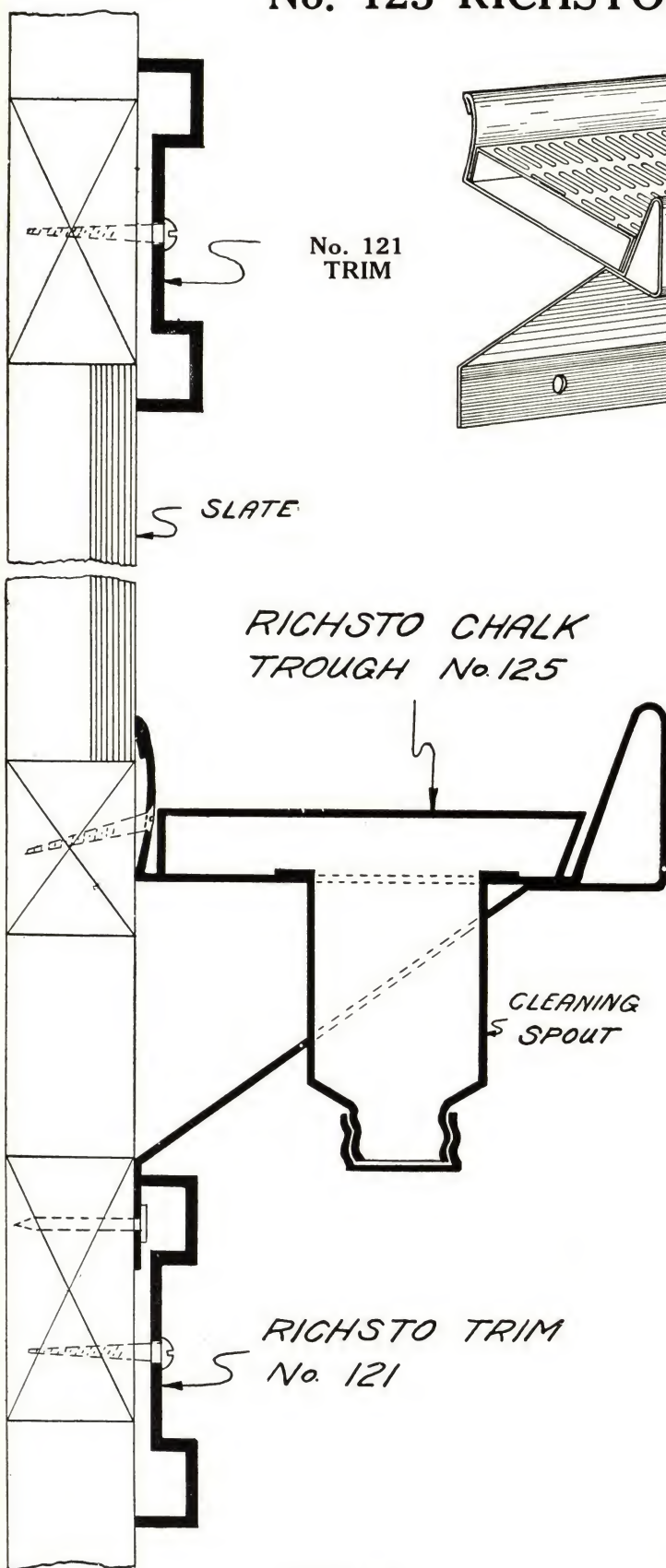


Standard Fittings for No. 116 Base and Their Cor- responding Nos.

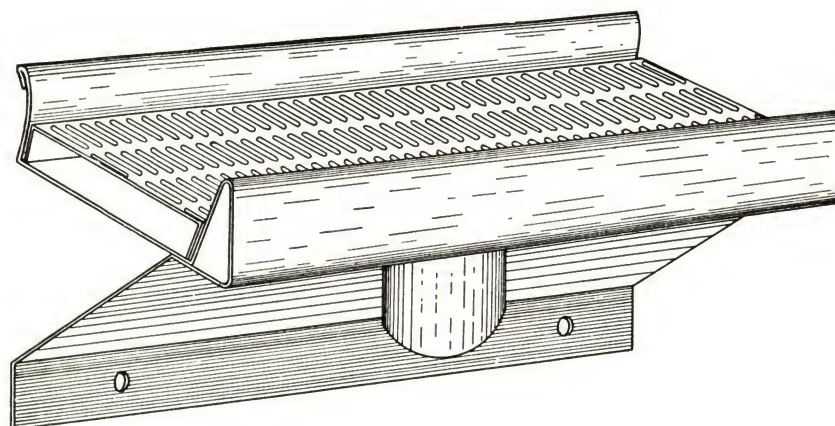
	4" high	6" high
Inside square corner	116A	116A6
Outside square corner.....	116B	116B6
Inside round corner $\frac{3}{4}$ " radius.....	116C	116C6
Inside round corner $1\frac{1}{2}$ " radius.....	116D	116D6
Outside round corner $\frac{3}{4}$ " radius.....	116E	116E6
Outside round corner $1\frac{1}{2}$ " radius	116F	116F6
Right end stop.....	116H	116H6
Left end stop.....	116J	116J6
Right plinth for No. 137 casing.....	116K	116K6
Left plinth for No. 137 casing.....	116L	116L6
Right plinth for No. 138 and No. 141 casing....	116M	116M6
Left plinth for No. 138 and No. 141 casing....	116N	116N6
Right plinth for No. 139 and No. 140 casing....	116P	116P6
Left plinth for No. 139 and No. 140 casing....	116R	116R6

It will readily be seen that these lists comprise a complete supply of fittings for all ordinary uses in connection with base, namely square and round corners, end stops, and plinth for connecting each base with each casing or a wooden casing. Nevertheless we are glad to cooperate in the designing of other fittings that may be more suitably adapted to special conditions and are equipped to produce same with a minimum of delay.

No. 125 RICHSTO Chalk Trough



FULL SIZE



The Richsto No. 125 Chalk Trough is made of 24 gauge sheet steel. It can be firmly attached to the wall with wood screws as shown in illustration. The perforated tray is removable for cleaning purposes. A down spout with a removable cap for cleaning is include in each section. It makes a strong, sanitary and attractive appearing installation for use in connection with all blackboards.

Stock lengths 10 feet. Special lengths to order.

Weight 1440 pounds per M feet crated.

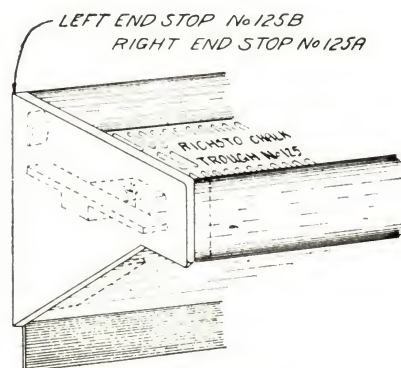
Metal Trim

Our No. 121 Trim is here shown as used in connection with chalk trough and blackboard. This article has many other uses such as trimming built-in bookcases, shelving, etc.

Stock lengths 10 feet. Special lengths to order.

Made of 20 gauge steel.

Weight approximately 515 pounds per M feet crated.



HALF SIZE



TRADE-MARK

For Building Economy**Use a Board Form Insulating Material.**

Insulite is made of waterproofed wood fibres, clean, odorless and vermin-proofed; felted one half inch thick into large sheets, assuring economical application. INSULITE is in wide-spread use and giving completest satisfaction as:

**Plaster Base
Sheathing****Wall Board
Thermal Insulation**

Insulite is the original board-form insulation, strong and durable, tried and proven by years of service and tests of every kind.

Tests

Tests by the U. S. Bureau of Standards show INSULITE one inch thick has conductivity of 7.1 B. t. u. per 24 hrs. per square foot per degree F. The lowest conductivity of any insulating material of its character.

Service

After eight and one half years of continuous service in the floors of Santa Fe Railway refrigerator cars Insulite showed no disintegration.

INSULITE STANDARD SIZES AND WEIGHTS

Thickness, in.	Width, in.	Lengths in ft.	Sheets per bundle	Weight, lb. per 1000 sq. ft.
1/2	48	8, 8 1/2, 9, 10, 12	6	Approx. 700

Specification A—Detail A-1

Insulite Plaster Base for Walls and Ceilings—Apply 1/2-in. Insulite Plaster Base "burlap, finish side exposed," directly to and parallel with studding and ceiling joists 16 in. o.c.

Note: On ceiling, for 1-in. roof insulation, apply 1 course 1/2-in. Insulite Insulation before applying 1/2-in. Insulite Plaster Base, breaking all joints, using 1 1/4 or 2-in. nails. See paragraph A-3.

(1) **Joints**—Do not butt joints, keep 1/4-in. clearance between Insulite Boards.

(2) **Headers**—Place 2x4 nailed securely between studs or joists at intersection.

(3) **Nailing**—Nail with standard galvanized or cement coated roofing nails, 1 1/4 or 1 1/2 in., 7/8-in. head, 4 1/2 in. apart on each stud, joist or header and all edges. First nail to intermediate studs or joists, then edges and ends.

(4) **Angles and Corners**—Use approved corner bead, all exposed angles. Reinforce plaster in corners with 3-in. strip or 3/8 or 1/2-in. mesh wire cloth. Nail securely.

(5) **Plastering**—Plaster 3/8 in. thick according to standard hard wall plaster manufacturers' specifications.

(6) **Ventilate**—After initial setting of plaster.

Note: Plaster, when applied, contains approximately 50% water. Approximately 20% is assimilated in re-crystallization or drying; the balance, 80%, of the water must be removed by evaporation and carried out of the building by means of adequate ventilation. Particularly is this true where salamanders are not used.

Note: When Insulite is used according to the above specification, a stronger more efficient wall is obtained and will be absolutely free from the usual cracks where wood lath are used. Insulite Plaster Base takes the place of both lath and insulation and saves one labor operation, effecting added economy.

UNIVERSAL INSULITE

**An Unequaled Insulation—Having Universal Application
It IS Cheaper to build a warm house than to heat a cold one**

INSULITE will make your house warmer in winter—cooler in summer

Specification C—Detail C-3

Insulite Sheathing Under Siding—Apply 1/2-in. Insulite Sheathing directly to and parallel with studding 16 in. o.c.

(1) **Headers**—Place 2x4's nailed securely between studding at each ceiling line, also at ends of Insulite Boards.

(2) **Nailing**—See paragraph A-3. Space nails 6 in. apart on all studding, plates and headers.

(3) **Paper or Coating**—Cover with paper or compound specified and apply siding as specified.

Note: When Insulite is used as a sheathing according to above specifications added shear strength is obtained and is stronger than wood sheathing in keeping the building plumb, due to the large Insulite Boards. Insulite sheathing takes the place of both wood sheathing and insulation, also saves one labor operation, effecting added economy.

Specification D—Detail D-4

Insulite Sheathing Under Shingles—Apply 1/2-in. Insulite Sheathing directly to and parallel with studding 16 in. o.c.

(1) **Headers**—See paragraph C-1.

(2) **Nailing**—See paragraph A-3. Space nails 6 in. apart on all studding, plates and headers.

(3) **Paper or Coating**—Cover with paper or compound as specified and apply furring.

(4) **Furring**—Place 7/8 or 1x3 in. or 4 in. at right angles of studding 6 in. o.c. if shingles are specified 6 in. to the weather; if 8 in. to the weather 8 in. o.c.

Note: See note under specification C-3.

Specification E—Detail E-5

Insulite Sheathing Under Stucco—Apply Insulite Sheathing directly to and parallel with studding 16 in. o.c.

(1) **Headers**—See paragraph C-1.

(2) **Nailing**—See paragraph A-3. Space nails 6 in. apart on all studding, plates and headers.

(3) **Paper or Coating**—Cover with paper or compound as specified and apply furring.

(4) **Furring**—Place 7/8 or 1x7/8 in. or 1 in. or wider as specified directly over and parallel with studding, nailed securely and apply both as specified.

Note: See note under specification C.

Specification F—Detail F-6

Insulite Sheathing Under Brick Veneer—Apply Insulite Sheathing directly to and parallel with studding. 16 in. o.c.

(1) **Headers**—See paragraph C-1.

(2) **Nailing**—See paragraph A-3. Place nails 6 in. apart on all studding, plates and headers.

(3) **Paper or Coating**—Cover with paper or compound as specified and apply lath furring.

(4) **Furring**—Place lath or heavier furring at right angle of studding on 16 or 18-in. centers, and nail brick ties through furring to studding.

Note: See note under specification C-3.

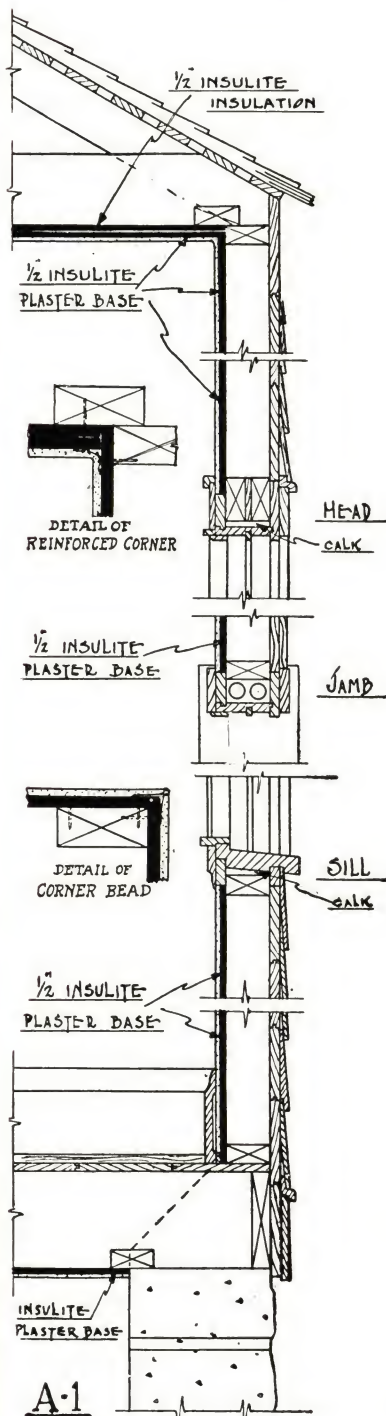
STANDARD SALT AND CEMENT COMPANY — DULUTH

INSULITE SPECIFICATIONS AND DETAILS — Continued from Page 70

NOTE:-

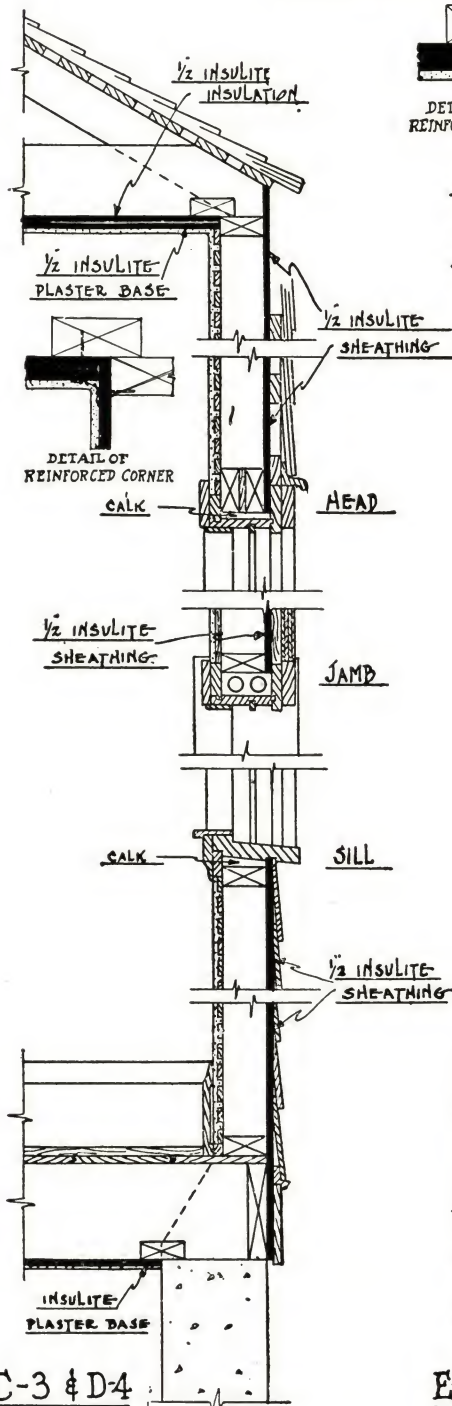
FOR ROOF & CEILING INSULATION:

$\frac{1}{2}$ INSULITE INSULATION — $\frac{1}{2}$ INSULITE PLASTER BASE — INSULATION



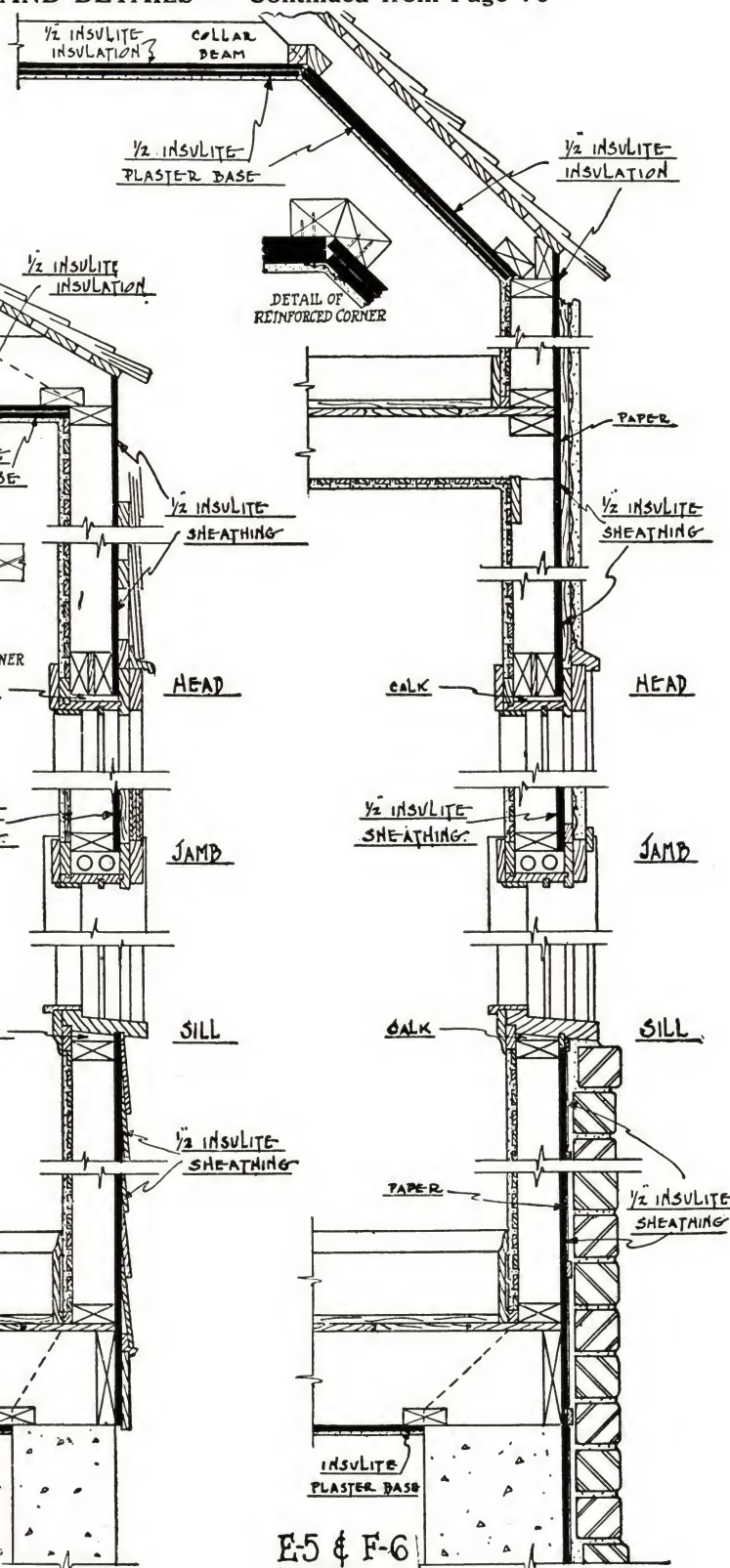
A-1

INSULITE DETAIL
INSULATING PLASTER BASE—WALLS & CEILING
INSULITE INSULATION FOR CEILING



C-3 & D-4

INSULITE DETAIL
INSULATING SHEATHING UNDER SHINGLES
INSULATING SHEATHING UNDER SIDING



E-5 & F-6

INSULITE DETAIL
INSULATING SHEATHING UNDER STUCCO
INSULATING SHEATHING UNDER BRICK VENEER

NOTE—The customary economical and practical methods are shown above — Specifications and full size details furnished — Details and Specifications for Dairy Barns, Silos, Creameries, Coolers and Ice Houses, Poultry and Hog Houses, Vegetable and Fruit Houses etc. Supplied on request.

Scale - $\frac{3}{4}$ in. Equals - 1 ft.

INSULITE SPECIFICATIONS AND DETAILS — Continued from Page 71

Specification B—Detail B-2

Insulite Wall Board for Walls and Ceilings—Apply $\frac{1}{2}$ in. Insulite Wall Board burlap finish side exposed, or as specified, directly to and parallel with studding, joists, collar beams or rafters, 16 in. o.c.

Note: On ceilings, for 1-in. roof insulation, apply 1 course $\frac{1}{2}$ -in. Insulite Insulation before applying $\frac{1}{2}$ -in. Insulite Plaster Base, breaking all joints using $1\frac{3}{4}$ or 2-in. nails. See paragraph A (3).

(1) **Panels**—Place panels and cover joists according to details.

(2) **Joints**—Do not butt joints. See paragraph A (1).

(3) **Headers**—See paragraph A (2).

(4) **Nailing**—Nail under cover joints. See paragraph A (3). At exposed bearings anchor with $1\frac{1}{2}$ -in. finishing nail driven at angle of 45° set slightly below surface.

(5) **Finish**—Size and paint or stain, size and varnish.

Note: Acoustical Correction—Insulite Wall Board, natural finish or airbrush stained, is an excellent medium for sound absorption and checks reverberation in acoustical correction.

Note: Insulite Wall Board is made over a bronze screen giving it a canvas or fine burlap effect, lending itself most admirably to artistic decorative treatment. Due to its strong cellular structure, Insulite Wall Board does not warp or buckle, and takes the place of insulation and ordinary wall board, effecting added economy, saving one labor operation. The insulating value of Insulite Wall Board compares favorably with 6 courses of ordinary wall board.

Specification G—Detail G-7

Roof Deck and Ceiling Insulation—Decks of Wood Mill Construction, flat, pitched, concave or convex.

Apply $\frac{1}{2}$ -in. Insulite Insulation directly to the wood deck, mop with asphalt or pitch, or nail as specified and apply roof as specified.

Apply $\frac{1}{2}$ -in. Insulate Plaster Base directly to lower edge and parallel with ceiling or roof joists, 16 in. o.c.

(1) **Joints**—See specification A (1).

(2) **Headers**—See specification A (2).

(3) **Nailing**—See specification A (3).

One Inch Insulation—Where 1-in. insulation is required on ceiling see specification A—first note—or apply second course of $\frac{1}{2}$ -in. Insulite Insulation on deck, breaking joints. Thoroughly mop with asphalt or pitch between first and second course, or nail with $1\frac{3}{4}$ -in. roofing nails and apply roof specified.

Specification HA—Detail HA-8

Concrete or Tile Roof Deck Insulation—(1) Mop deck thoroughly with asphalt or pitch, apply $\frac{1}{2}$ -in. Insulite Insulation while hot. Apply roof as specified.

(2) **One Inch or More of Insulation**—Mop and apply additional $\frac{1}{2}$ -in. course of Insulate Insulation, breaking all joints. Apply roof as specified.

Specification HB—Detail HB-9

Reinforced Concrete Roof Deck Insulation—Apply $\frac{1}{2}$ -in. Insulite Plaster Base, burlap finish surface to the forms, well fitted in all corners and angles, tacking it sufficiently to hold it in place with $1\frac{1}{2}$ -in. finishing nails so that they will readily pull through the Insulite when forms are removed, leaving the Insulite thoroughly bonded to the concrete.

After the concrete and Insulite have thoroughly dried, plaster the Insulite with hard wall plaster according to the manufacturer's specifications.

Ventilation—See specification A (6).

Note: The above application is the most economical method of insulating the underside of slabs and beams preparatory to plastering for finish. Added insulation can be had by applying $\frac{1}{2}$ -in. Insulite Insulation, 1 course or more, on top of the slab. See specification HA (1).

Specification K—Detail K-10

Sound Deadening for Floors and Ceilings—**Insulite Insulation Deadening Application**—For brick or tile lined, wood joists, and stud construction with sound and fire stop, wall offset 2 to 4 in.

(1) **Top Plate Pads**—Cover all top plates with $\frac{1}{2}$ -in. Insulite Plate Pads (the width of the plates) before placing the joists and lathing strips.

(2) Where joists intersect the wall, after joists are spaced, place 1x2 or 4-in. wood strips paralleling the walls, nailed to bottom edge of joists to receive wall offset. Remove 1x2 or 4 in. after wall offset is built.

(3) Where joists parallel wall, set joists 2 in. from wall line. Place 1x4-in. wood strips paralleling the wall and nail the bottom edge of joists to receive wall offset. Anchor joists by placing 2x4x10-in. blocks 4 to 5 ft. apart spiked to joists. Remove 1x4's after wall offset is built.

(4) **Joist Pads**—Place $\frac{1}{2}$ x3-in.x4-ft. Insulite Joist Pads on the top edge of all joists and headers to receive underflooring which should be laid diagonal and tight.

(5) **Lower Plate Pads**—Place $\frac{1}{2}$ -in. Insulite Plate Pads projecting $\frac{3}{4}$ -in. on each side of the plates of partition walls to receive grounds for lath and plaster.

(6) **Before Lathing**—Apply $\frac{1}{2}$ -in. Insulite Insulation on ceiling nailed to bottom edge of floor joists; all joints to be well fitted.

(7) **Headers**—Place 2x2 or 4-in. headers nailed securely between joists at intersection.

(8) **Nailing**—See paragraph A (3). Space nails 6 in. apart on all joists, plates and headers.

(9) **Furring**—Place $\frac{7}{8}$ x2-in. strips directly under and parallel with joists, nailed securely to receive lath and plaster.

(10) **Under Finish Floors**—Cover underfloor with $\frac{1}{2}$ -in. Insulite Insulation, joints fitted tight against plate pads, etc. and lay finish floors directly thereon. No furring strips.

Note: The above application of $\frac{1}{2}$ -in. Insulite Insulation on the ceiling furring down for lath and plaster forms an additional air space between the Insulite and the lath and plaster which increases the deadening efficiency.

If further increased deadening efficiency is required replace the lath with an additional course of $\frac{1}{2}$ -in. Insulite Plaster Base. See specification A (1) (2) (3) (5) (6).

Specification L—Detail L-12

Sound Deadening for Partition Walls—All lower plates are placed on $\frac{1}{2}$ -in. Insulite Plate Pads projecting $\frac{1}{2}$ in. on each side of the plates. The top plates are covered with $\frac{1}{2}$ -in. Insulite Plate Pads projecting $\frac{1}{2}$ in. on each side of the plates.

Apply $\frac{1}{2}$ -in. Insulite Insulation on each side of studding continuous from upper to lower plate pads, making all joints tight on studding, plates or headers, nailing in place. Then furr with $\frac{7}{8}$ or 1x1 $\frac{1}{2}$ -in. strips for lath and plaster.

Note: If a more efficient sound deadened wall is required apply $\frac{1}{2}$ -in. Insulite Plaster Base in place of wood lath for plaster. See paragraph A (1) (2) (3) (4) (5) (6).

Advantages

Insulite is furnished in sizes convenient to handle, light in weight, economical to apply, easier to saw and nail than lumber; 1000 sq. ft. of Insulite covers 1000 sq. ft. of surface area, saving the usual 20 to 25% waste when lumber is used.

INSULITE SPECIFICATIONS AND DETAILS — Continued from Page 72

NOTE:

ROOF & CEILING INSULATION:

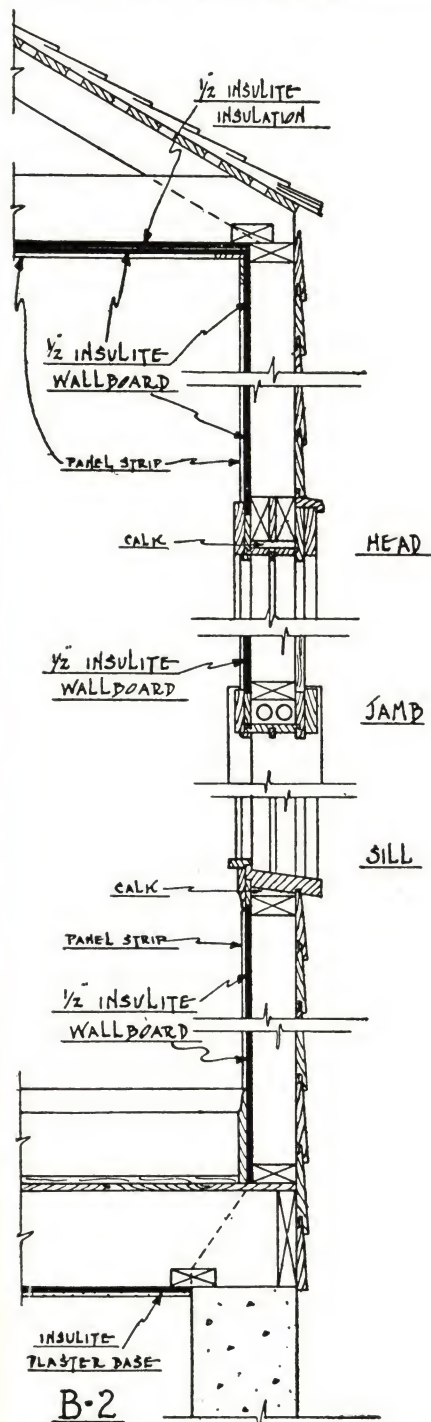
 $\frac{1}{2}$ " INSULITE INSULATION—

—DO NOT PLASTER

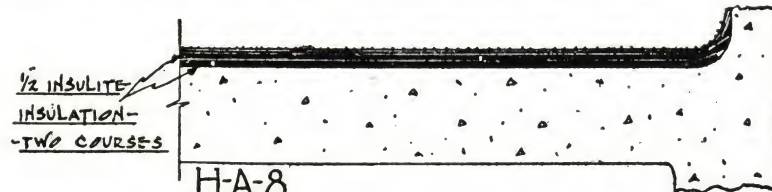
 $\frac{1}{2}$ " INSULITE PLASTER BASE

1" ROOF

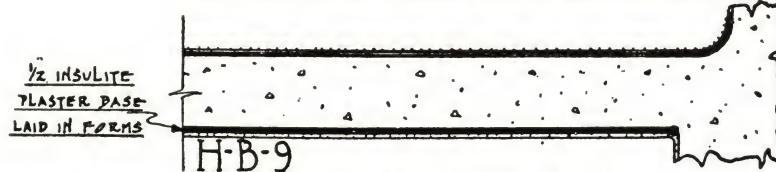
INSULATION

 $\frac{1}{2}$ " INSULITE
INSULATION—
—TWO COURSES

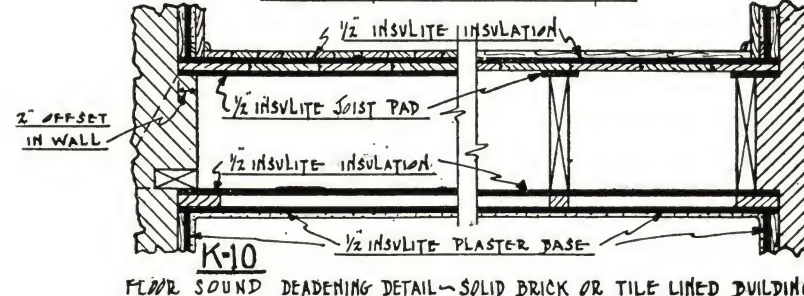
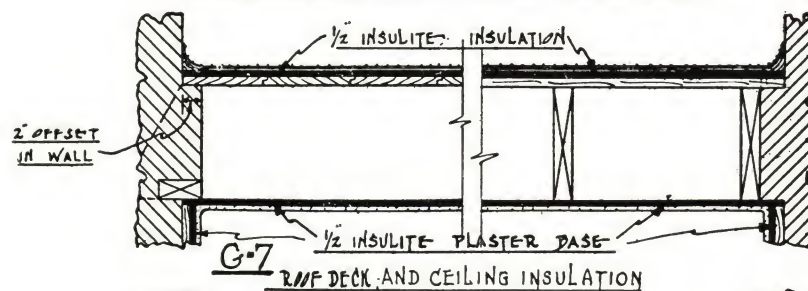
INSULITE DETAIL
INSULITE WALLBOARD—WALLS & CEILINGS
INSULITE INSULATION FOR CEILINGS



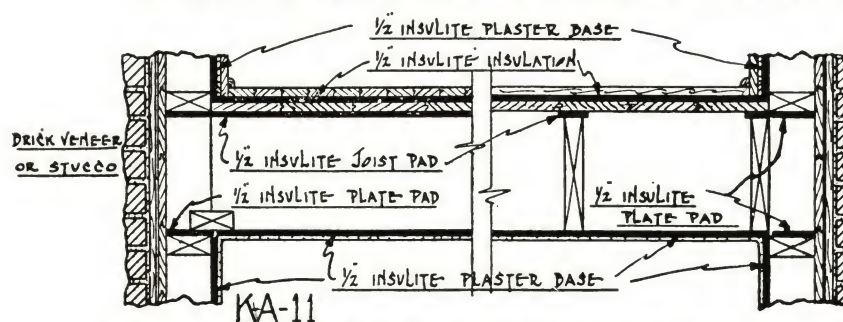
CONCRETE ROOF DECK INSULITE DETAIL
TWO COURSES $\frac{1}{2}$ " INSULITE INSULATION MATTED DOWN ON TOP SLAB



CONCRETE ROOF DECK INSULITE DETAIL
 $\frac{1}{2}$ " INSULATING PLASTER BASE TO RECEIVE FINISHED PLASTER



FLOOR SOUND DEADENING DETAIL—SOLID BRICK OR TILE LINED BUILDING



FLOOR SOUND DEADENING DETAIL—FRAME BUILDING STUDS PLATED EACH FLOOR



PARTITION SOUND DEADENING DETAIL—ONE OR TWO LAYERS EACH SIDE

NOTE—Customary and Practical Methods shown above — Specifications and Full Sized Details furnished. Heat Loss Chart, Specifications and Details of Industrial Building Roofs Supplied on request.

Scale— $\frac{3}{4}$ in. equals 1 ft.

CELOTEX

INSULATING LUMBER

Celotex is the board form insulating material that

REPLACES WOOD SHEATING

It shows greater structural strength—and insulates. It resists the passage of heat and cold like a heavy woolen blanket.

Has the insulating value of cork—Stronger than shiplap and three times warmer. Provides insulation and strength at the cost of one material.

Celotex is made from cane fiber, the longest, strongest fibre obtainable for board manufacture. It is of uniform structure throughout, is not built up of layers and is not dependent upon any adhesive for its remarkable strength. In the process of manufacture, the cane fibre is firmly matted and interlaced, forming a tough, rigid board.

Due to its light weight (approximately 60 lbs. per 100 sq. ft.), convenient sizes ($7/16$ " thick x 4' wide x 8' to 12' long), ease and low cost of application, and its replacement of board lumber as a sheathing, Celotex saves money for every user and makes homes more comfortable the year round.



CONDENSED SPECIFICATIONS FOR APPLYING

General: Framing shall be same as in ordinary frame construction, taking precaution to brace studs, joists and rafters 16" on centers. Wherever it is necessary to have a horizontal joint in the CELOTEX a 2"x2" or 2"x4" header shall be cut in between studs, joists or rafters.

Ceilings shall have headers cut in between joists not over 48" on centers or the joists shall be securely bridged.

Masonry walls should be furred with strips 1"x2" securely anchored, 16" on centers, and horizontal furring strips on not over 48" centers, with a solid furring strip nailing base provided around every edge of all CELOTEX boards.

Application: The Celotex boards shall be applied vertically to the studs, and lengthwise of the joists and rafters. Celotex shall be placed so as to have a bearing for nailing along all edges. When necessary to use more than one course to cover height of building, vertical joints shall not

meet on the same stud except when paneling design makes it necessary.

Leave $3/16$ " space between adjoining boards, also at top and bottom of boards. Where a snug joint is desired as around window and door frames, sills, plates, etc., the Celotex shall be fitted carefully and brought to moderate contact. Do not force into place.

Nailing: Set Celotex boards in place and begin nailing at top, or at either end to intermediate studs, joists, rafters or furring strips; nail to intermediate nailing bases first, then entirely around all edges of each board to studs, sills, plates, joists, rafters, headers or furring strips. Use standard $1\frac{1}{2}$ " roofing nails with $\frac{3}{8}$ " head; space nails 4" apart, driving nails until heads are flush with the surface of Celotex. Nails shall be placed approximately $\frac{3}{8}$ " from edge of boards. Note exceptions under Interior and Exterior finish.



Residence of Julian Smith, Wilmette, Ill.
Norman W. Cook, Architect
Celotex Used for Sheathing and Roof Insulation

STOCK SIZES

Quick Shipment at All Times.

Thickness, approximately $7/16$ in.

Width 48 in.

Lengths — 8 feet

$8\frac{1}{2}$ "

9 "

$9\frac{1}{2}$ "

10 "

12 "

Weight—Approx. 60 lbs. per 100 sq. ft.

There is a use for **CELOTEX** in every Building

This illustration shows a number of the practical uses of CELOTEX. In the floor it is used between the rough and finished flooring, as a sound deadener and insulation; on the first floor walls and ceilings it is a combined plaster base and insulation; on the second floor walls and ceilings CELOTEX combines a beautiful interior finish with insulation; on the roof it is nailed directly to the rafters, adding strength to the building and providing adequate roof insulation; on the exterior walls CELOTEX replaces lumber as sheathing, adding insulation, and forms a base for brick veneer. It is nailed directly to the studding, brick veneer being laid around it.

Siding or stucco may be applied in the same manner as over ordinary wood sheathing.

(Specifications Cont'd)

CELOTEX AS OUTSIDE SHEATHING

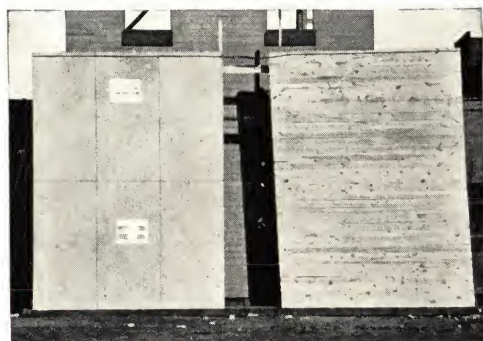
Buildings with Stucco Exterior—follow general instructions, after which wood or metal furring strips shall be applied over and nailed through the Celotex to each stud; over this apply wood or metal lath, or beveled wood lath; or self furring metal lath may be applied directly over the Celotex, nailing or stapling securely to each stud. Magnesite or cement stucco shall then be applied, in accordance with manufacturer's specifications.

Wood Siding or Shingle Finish—follow general instructions given above.

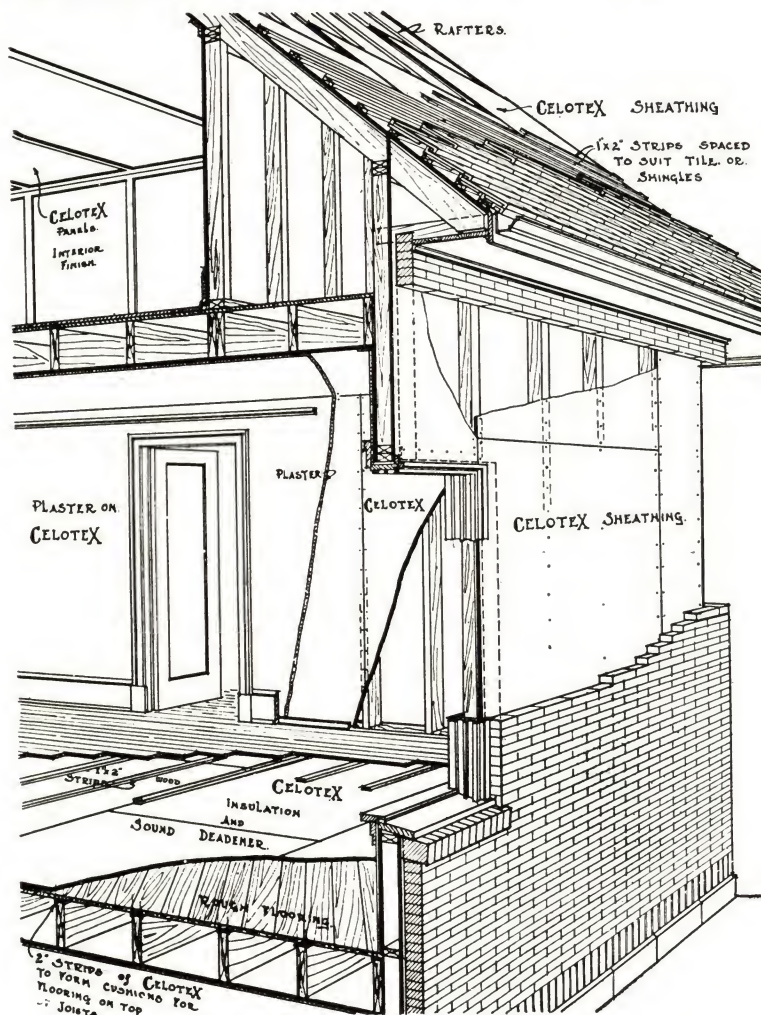
If wood siding is to be used, apply it directly over Celotex, nailing through Celotex to the studs. Siding boards shall butt over studs.

If walls are to be shingled, shingle lath shall be applied over Celotex and nailed through to the studs; then the shingles shall be nailed to the shingle lath.

Brick Veneer Buildings: Anchors shall be nailed through Celotex to outside face of studding, staggered and spaced in customary manner. The brick work shall then be laid up, bedding the anchors securely in the joints of the brick work.



INDIANAPOLIS BUILDING DEPT. TEST
Shows CELOTEX six times stronger than wood sheathing. CELOTEX Insulating Lumber has been exhaustively tested for practically every building use and under many and varied conditions. We have copies of a number of these test reports in our files. Ask us about your insulating problems.



CELOTEX AS PLASTER BASE

Follow general instructions in using Celotex for walls, partitions and ceilings, on either frame or masonry construction for plaster base, and serving at the same time as inside sheathing, lath and insulation.

Use galvanized metal corner beads from floor to ceiling, on all exposed corners. On all interior corners, both walls and ceilings, 6" strips of No. 24 gauge expanded metal lath may be used if desired. They shall be nailed securely through Celotex to studs, joists, rafters or furring strips.

DO NOT wet or dampen Celotex before applying plaster.

The use of wood fiber plaster is recommended. Hard Wall (Gypsum Cement) plaster has been used in hundreds of jobs and is satisfactory. The wood fiber plaster however, is stronger, tougher and less brittle than the Hard Wall plaster and due to these qualities is becoming more and more generally used where a first quality plaster job is required.

Wood fiber plaster is used just as it comes to the job with merely the addition of water. Hard Wall plaster requires the addition of sand. One part of plaster to two parts clean coarse sharp sand.

Apply plaster directly to Celotex walls and ceilings in the same manner in which it would be applied to wood lath.

Any finish desired can be secured same as over any other type of plaster base.

VENTILATION while drying is very important. Cold and hot air or moisture will not pass through Celotex. The plaster must dry by giving up its moisture to the air in the room. The room must be ventilated to carry away this moisture. It is absolutely necessary, especially in winter, to give proper attention to ventilation while plaster is drying.



CELOTEX AS ROOF INSULATION

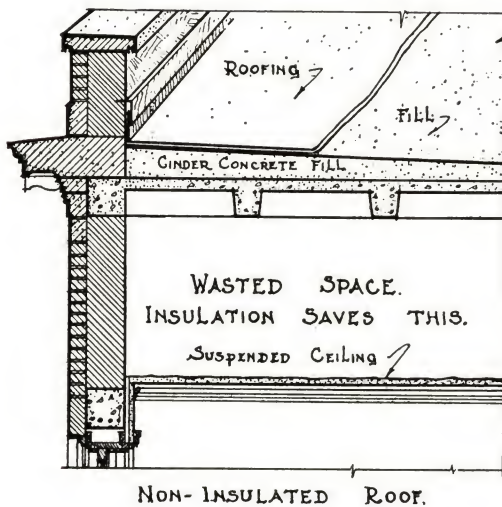
Wood Construction Pitched Roof

In wood roof construction Celotex may be applied on either top or bottom side of the rafters. Application on the underside is recommended where roofs are to be covered with materials which require a solid wood deck for nailing. This method also permits installation of Celotex in existing roofs. General Instructions page 74 should be followed.

CELOTEX FOR ROOF INSULATION

Flat Roof—Wood or Concrete

See next page.



High heat losses—Condensation—Wasted space

CELOTEX AS INTERIOR FINISH

Order Celotex boards of standard lengths such as will nearest conform to the paneling design.

In laying out the studding and joists, consideration must be given to the design of paneling required, using extra studs and joists, if necessary. In the most substantial construction, headers shall also be provided back of chair rail and all other mouldings.

Nailing: On intermediate studs, joists or headers not covered by panel strips or moulding, use $1\frac{1}{4}$ " finishing nails; space nails on 4" centers; drive them at an angle of 60 degrees, and so that the heads lie slightly below the surface. Use fine nail set to avoid marring surface of Celotex.

Mouldings or strips for panels not less than 2" wide shall be used to cover all joints.

Painting and Decorating: The Celotex may be left with its natural finish, or it may be painted or decorated with paints, stains or kalsomine. All painting or decorating shall be done before applying panel strips or mouldings. See Painting instructions.

If Celotex is used as an interior finish for the purpose of acoustical correction, it must not be painted, but it may be stained provided no sizing is used.



SPECIFICATIONS FOR SIZING, PAINTING OR STAINING CELOTEX

Sizing: To secure maximum covering capacity, the surface of Celotex should be sized, or primed.

Painting: Any standard grade paint may be applied to Celotex, when sized as above. One coat gives sufficient protection, but to obtain a high gloss two coats are necessary.

Staining: For staining use two coats of glue size, as above. Apply alcohol stains over this. Benzol stains work well, but do not give as good results as alcohol stains. When desired, white shellac or colorless varnish may be applied over the stain to protect it, and give a high gloss; or the stain may be omitted and the Celotex varnished or shellacked.

NOTE: For acoustical correction Celotex must not be painted, but it may be stained, provided no size is used.

CELOTEX FOR FLOOR DEADENING

In Buildings with Wood Floor Joists

Application: Nail Celotex strips 2" wide to floor joists. Sub-flooring shall be laid over these joist pads, and nailed through to the floor joists in the usual manner. One thickness of Celotex shall be laid over the sub-flooring, lengthwise of floor joists; bringing edges of boards to moderate contact with each other and with walls, and nail securely to sub-flooring with common 6d. nails. Place 1"x2" wood strips 16" on centers over joists, nailing these strips through the Celotex to the sub-floor. Nail finished floor to the wood strips, using nails that will not project through the wood strips into the Celotex.

Celotex shall be applied on all walls and ceilings as specified for plaster base or interior finish.

Alternate No. 1: The above method of floor deadening is preferred. If desired, sub-flooring may be laid directly on floor joists in the usual manner without joist pads. Celotex shall then be laid lengthwise of floor joists and nailed securely to sub-flooring with 6d. nails. Finished floor may then be laid on the Celotex and nailed through the Celotex to the sub-flooring.

Alternate No. 2: Wood sub-flooring may be omitted, and if omitted, Celotex must not be applied until building is ready for finished flooring. Wherever it is necessary to have a horizontal joint in the Celotex, a 2"x4" header shall be cut in between the floor joists. Similar headers shall also be cut in between the joists, spaced not over 48" on centers. Apply Celotex lengthwise of the floor joists, and the finished floor over Celotex, as in Alternate No. 1.

CELOTEX in Roof Insulation

A Celotex-insulated roof reduces coal consumption. Heated air rises, and unless there is adequate insulation 20% to 30% of the fuel used in heating is often wasted.

Condensation or sweating, caused by warm air coming in contact with the cold roof is another serious roof evil that can only be cured by insulation. Celotex roof insulation prevents dripping, which spoils furnishings, materials, or machinery. It also prevents damp or discolored

ceilings and spoiled decorations.

With Celotex Roof insulation it is not necessary to build an extra half story to overcome heat loss and condensation. The cost of the extra half story is much more than the cost of Celotex, and is nowhere near as efficient.

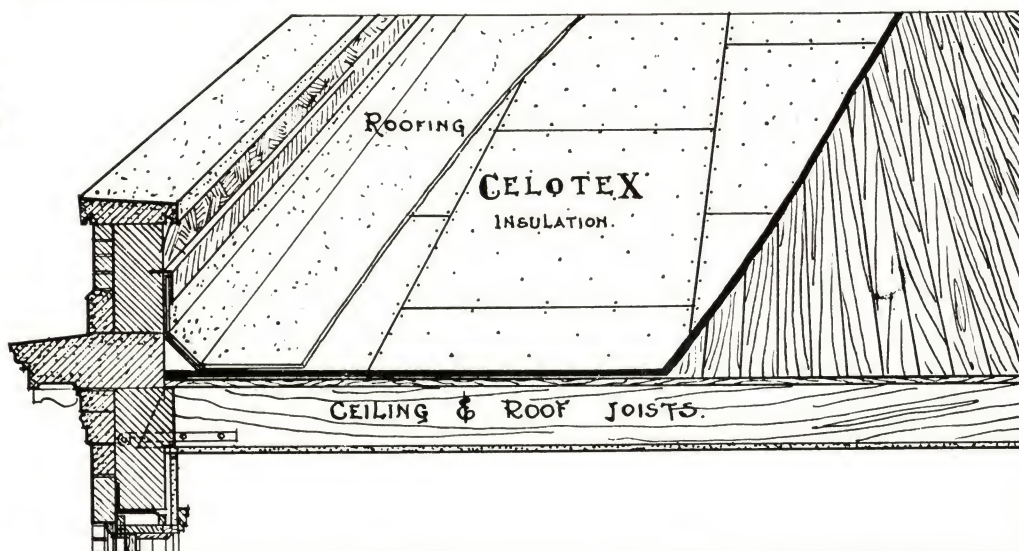
Insulated roofs on homes, apartments, hotels, office, factory and industrial buildings are an economic necessity. Build your roofs to shed heat and cold as they shed water.

CELOTEX
INSULATING LUMBER

As Roof Insulation over Wood Deck

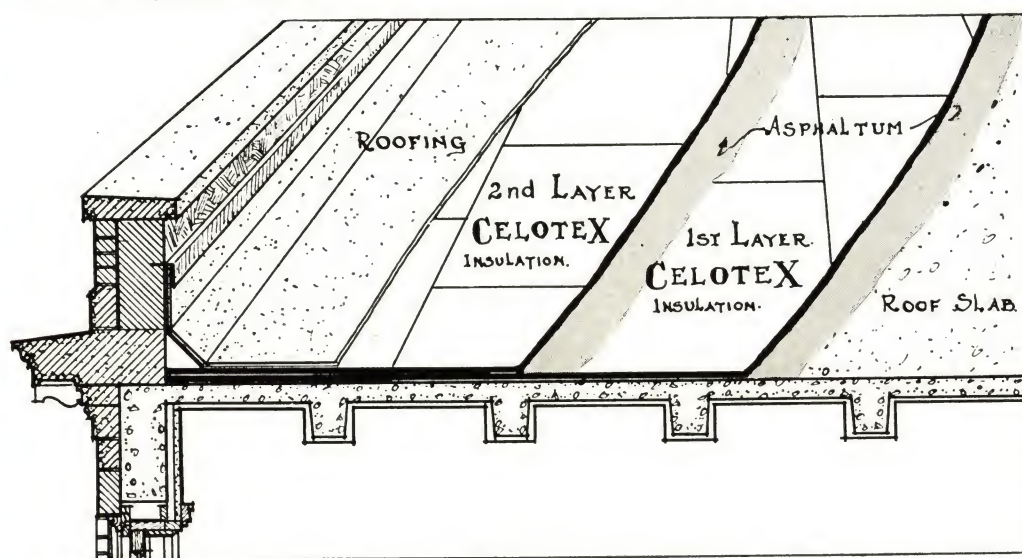
A Suggested Architects Specification

Roof deck shall be constructed of seasoned lumber, laid to slope and pitched to drain, as shown on plans and specifications. Nail cant strips around walls and where required. Sweep deck clean before laying Celotex. Nail first layer to wood deck, using $1\frac{1}{2}$ " standard roofing nails $\frac{3}{8}$ " heads, staggering and placing nails on 12" centers. Transverse joints and joints of successive layers shall be



broken.

Leave $\frac{3}{16}$ " space between adjoining edges of Celotex board, being careful to fit tight joint with walls and around all roof projections, but do not force into place. Additional layers of Celotex required shall then be applied as per specifications above. Apply any suitable roofing material in accordance with the manufacturer's specifications.



As Roof Insulation over Concrete Deck

A Suggested Specification

The roof deck shall be reasonably smooth, dry and well cured. Prime deck with G-F No. 16 concrete deck primer. Sweep deck clean before laying Celotex. Nail cant strips around walls and where required. Leave $\frac{3}{16}$ " space between adjoining edges of Celotex boards. Be careful to fit tight joints with walls and around all roof projections, but do not force into place. Mop deck with a heavy uniform coat of hot roofing pitch or asphalt, using not less than 30 pounds per 100 square feet. Embed Celotex firmly

into place while mopping is hot.

Transverse joints and joints of successive layers shall be broken. Additional layers of Celotex required shall be mopped to the underlying layer, same as above, being careful to break joints with underlayer or layers. Apply any suitable roofing material in accordance with the manufacturer's specifications.

Caution: Concrete deck must be dry. Roofing pitch or asphalt will not bond to a wet surface.

Asphalt Shingles

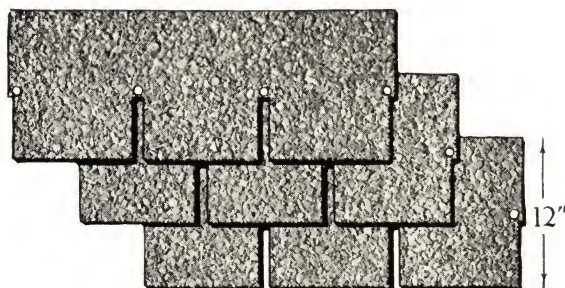
Our asphalt shingles are manufactured from materials which have been tested and proved by many years of actual service. They are made from a base of extra heavy roofing felt prepared especially for the purpose. The felt is first dipped in hot asphalt and thoroly saturated to make it waterproof and then heavily coated on both sides with an asphalt compound. They are surfaced with natural color crushed slate, which is rolled into the asphalt coating

while still hot, making a surface which never washes or blows off.

On account of more or less frequent changes in the prices of asphalt shingles, we show no quotation on this and the following sheets. Dealers handling shingles, roofing and building papers will be gladly quoted on application. Ask for our stock sheet mailed once every thirty days, for full information.

Flintkote Giant 3 in 1 Shingle

In the manufacture of these GIANT shingles the amount and quality of the felt used and the asphalt used for saturation are most carefully selected and proportioned to each other so that these shingles cannot dry out and lose their "life" for many years.

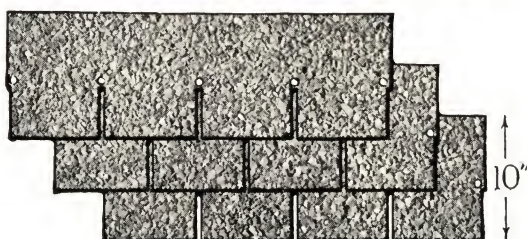


FLINTKOTE GIANT 3 in 1 SHINGLE

This is an extra heavy, double thick slab shingle designed to lay 5" to the weather. This GIANT shingle, which is truly a giant in every dimension, makes not only the most substantial shingle roof but one that is artistic as well.

The size of the shingles as exposed on the roof being 5"x11", with a cutout of 1" between, gives a pattern of pleasing size, especially on buildings having large expanses of roof surface. Bungalows with their large roof surfaces close to the ground are well adapted to the use of this shingle. Many churches have also used them for their durability and the fact that with the ordinary asphalt shingle (either individual or 4 in 1) the 4"x8" unit exposed appears very small on their large roofs.

Flintkote 4 in 1 Shingle



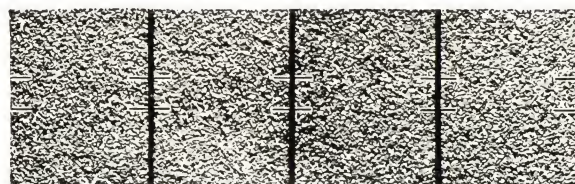
FLINTKOTE 4 in 1 SHINGLE

We can honestly recommend this shingle as being absolutely the best quality product in a standard weight shingle.

Manufactured from absolutely the same quality felt and asphalt as used in our GIANTS (description above) with the same care and supervision. Gives the smaller 4x8" pattern on the roof, 100 strips to the square—slabs are 10" wide, 36" long. Colors same as our GIANTS—Red, Green, Peach Bottom Blue-Black Slate and "Color-Drift." Fully guaranteed by the manufacturer.

Approximate weight per square.....195 pounds
Packed.....2 bundles per square
Quoted per square.....Price on application

Certainteed Strip Shingle



A solid slab shingle, manufactured of a high grade felt base, slate surfaced. This shingle is marked instead of being cut out, but applied on the roof the effect is similar, except that the markings are more distinct.

Can be furnished in either Red or Green slate surface. Size of slab 10" wide by 32" long.

Approximate weight per square.....196 pounds
Packed.....2 bundles per square
Quoted per square.....Price on application

Individual Shingles

For those who prefer the old style Individual Shingle, we still carry a stock of these, manufactured from the same grade felt and saturation as our standard weight strip shingle and in either Red or Green slate surface. Size of these shingles 8 3/4"x12 3/4".

Approximate weight per square.....245 pounds
Packed.....4 bundles per square
Quoted per square.....Price on application

COMPOSITION ROOFING

The rigorous climate of Northern Minnesota and Wisconsin demands a roofing made of the very best materials obtainable. It must not only be waterproof and weatherproof but must withstand the extreme cold of winter and heat of summer and

give many years of satisfactory service to mark it as a roofing of merit.

After investigating many lines, we have chosen the following brands as best measuring up to our high standard of quality.



CERTAINTEED

A strictly first quality, smooth surface roofing, made from the best roofing felt, thoroly saturated and coated with a pure asphalt compound—will not crack or dry out—guaranteed by the manufacturer.

Each roll contains 108 square feet—enough to cover 100 square feet of roofing, allowing for a two inch lap. Nails and roof cement packed in center of each roll.

No.	1	2	3
Weight per square, lbs. 35	45	55	



MAJOR

A standard quality roofing of exceptional value—wool felt base saturated with asphalt and heavily coated—corrugated surface—carries the manufacturer's guarantee. Each roll contains 108 square feet—enough to cover 100 square feet of roof, allowing for a two inch lap. Nails and lap cement packed in center of each roll.

No.	1	2	3
Weight per square, lbs. 35	45	55	



CORPORAL

A good grade of roofing at a low price—made from roofing felt well saturated with asphalt compound—a very fine roofing to use where price is the first consideration. Rolls contain 108 square feet or enough to cover 100 square feet of roofing, allowing for a 2 inch lap. Nails and cement packed in center of each roll.

No.	1	2	3
Weight per square, lbs.	35	45	55



GUARD

A medium grade of talc surface roofing for use on temporary buildings, camps and sheds, where the best is not required. Roofers felt base, thoroly saturated in asphalt compound. Exceptionally reasonable in price and will give excellent service. Rolls contain 108 square feet or enough to cover 100 square feet of roofing, allowing for 2 inch lap. Nails and lap cement packed in center of each roll.

No.	1	2	3
Weight per square, lbs.	35	45	55

SLATE SURFACED ROLL ROOFINGS

Surfaced with crushed slate, evenly ground and firmly imbedded in a heavy asphalt mastic—made from very heavy wool felt saturated and coated with asphalt. Carried in both Red and Green colors—lays up into a very beautiful permanent roof—Weatherproof—Sparkproof and wears like iron. Guaranteed by the manufacturer.

Weights of our slate surfaced roofings shown below are approximate and will vary somewhat due to variation in the weight of surfacings. The quality and durability of the roofings are not affected as the amounts of asphalt and felt per square—the real life of the roofing—remain uniform. Rolls are 32 inches wide and contain 108 square feet or enough to cover 100 square feet on the roof, allowing for 2 inch lap. Nails and lap cement are packed in the center of each roll.

CERTAIN-TEED (Extra Quality)

Guaranteed 10 Years
Weight, 90 lbs. per roll.

MAJOR BRAND

(Standard Quality)
Weight, 80 lbs. per roll.

NOTE—Roofings are subject to market changes in price. Write for our latest price list.

BUILDING AND INSULATING PAPERS



TARRED FELT

A waterproofed, tar saturated, wool felt base in three weights, for use under shingles, siding, stucco, or wherever a waterproof lining paper is needed. Also used in built up tar and gravel roofs.

Rolls are 32" wide and average about 45 to 48 lbs.

No.	1	2	3
Approx. sq. ft., per roll	216	324	500
Wt. per 100 sq. ft., lbs.	20	15	12



GRAY DEADENING FELT

Made of soft felt—used as a sound deadener and insulating material in walls and floors—also for wrapping pipes to protect against frost. Rolls are 36" wide and contain 50 square yards.

No.	40	50	75
Approx. Wt. per roll, lbs.	40	50	75



STRINGED FELT

Made from tough felt, thoroughly waterproofed—heavy threads run through the felt making it much stronger. For use between sheathing and siding or stucco—also in lining floors. Resists wind, moisture and vermin.

Rolls are 36" wide, containing 250 and 500 square feet.

Size	250 ft.	500 ft.
Approx. Wt. per roll, lbs.	22	44



CERTAIN-TEED INSULATING PAPER

The very best material to use for damp-proofing under siding, stucco, shingles, floors and wherever a moisture-proof lining is needed. A felt base paper well saturated and coated to make waterproof.

Rolls are 36" wide and contain 500 square feet.

Medium weight	30 lbs. per roll
Heavy weight	45 lbs. per roll
No. 30 (saturated only)	30 lbs. per roll
Tarred Sheathing	30 lbs. per roll



RED ROSIN SHEATHING

A tough and durable building paper for use under wood floors, for sheathing or lining where there is no moisture. Rolls are 36" wide and contain 500 square feet.

No.	Approximate Wt. per roll lbs.
20	20
25	25
30	30
35	35
40	40



BLUE PLASTER BOARD

A strong, durable, tough texture paper extensively used in place of lath and plaster for finishing walls and ceilings. Especially convenient and economical for cottages and temporary buildings. Can be prepared or decorated the same as on plastered wall. All rolls are 36" wide.

500 sq. ft. to roll	Weight 60 lbs.
250 sq. ft. to roll	Weight 30 lbs.

FLINTKOTE K-B SHEATHING PAPER

Patented May 6, 1919
IT IS WATERPROOF

A red rosin sized paper with waterproof asphalt center. Better than ordinary building paper although the cost is practically no greater.

Being waterproof it is used for a great diversity of uses.

Sample cut from regular stock roll demonstrating the toughness and waterproof qualities of K-B Sheathing will

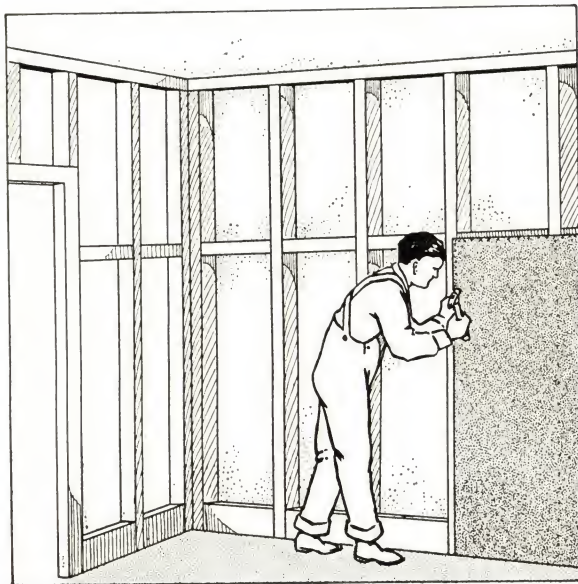
be furnished anyone interested.

Rolls are 36" wide and contain 500 square feet. Weight 30 lbs. Price on application.

NOTE: Prices of building papers are subject to market fluctuations. Write for special quotation on quantities you need. You will find our prices the lowest.

Wall Boards

ROCKWALL (Plaster Centered) BOARD



Our Rockwall board or "sheet plaster," as it is sometimes called, is made by rolling a hard setting patent plaster between two tough sheets of sized paper, producing a hard, solid sheet of wallboard which cannot warp or crack. Rockwall board is the only successful substitute for lath and plaster—it is strong, heavy and fire resisting; an excellent insulating material, which will make your house warmer in winter and cooler in summer—it deadens sound, being more soundproof than lath and plaster—can be painted, papered, kalsomined or decorated the same as an ordinary lath and plaster wall—a permanent and economical type of construction either for new work or remodeling purposes. Nail directly on the studding as shown in illustration for new work—may be nailed directly on top of old plaster or sheathing for repairs or remodeling. If used for finishing over concrete or brick walls, it is best to fur out with 1"x2" furring strips, spaced 16" center to center and nail plaster board on furring strips.

Size of Boards	Sq. Ft. per Sheet	Thickness inches	Ship. Wt. per sheet pounds
32"x36"	8	$\frac{3}{8}$	15
4' x 8'	32	$\frac{3}{8}$	64
4 x 9	36	$\frac{3}{8}$	72
4 x 10	40	$\frac{3}{8}$	80

Write for prices and samples.

BADGER WALL BOARD

An improved compressed fiber wall board, painted on both sides and ready to apply—a substitute for lath and plaster walls and ceilings on new work or for repairs and remodeling—a hard, dense board about one-sixth inch thick and comes in clean, light panels which can be sawed and nailed the same as lumber.

Badger Wall Board has a hard, smooth, sulphite finish which is entirely waterproof because the sizing is thoroly mixed with the pulp during manufacture.

Badger Wall Board is painted on both sides, ready to apply, one side a rich buff and a deep cream color on the other. You save the cost and labor of decorating unless you desire to finish it in a different color or use wall paper. It makes an attractive wall left in its natural color, the cracks being covered with paneling strips.

Width Inches	Length feet	Sq. Ft. per sheet	Sheets per bundle
32	6	16	16
32	7	18 $\frac{2}{3}$	14
32	8	21 $\frac{1}{3}$	12
32	9	24	11
32	10	26 $\frac{2}{3}$	10
32	12	32	8
48	6	24	11
48	7	28	9
48	8	32	8
48	9	36	7
48	10	40	7
48	12	48	6

Shipping weight about 540 lbs. per 1000 sq. ft.

Write for prices and samples.



HAVEMEYER REINFORCING BARS



ROUND



SQUARE

"EVERY POUND PULLS"

Rolled from new billet steel in ten standard sizes as given in table below.

Sizes are those recommended by War Industries Board and adopted as standard by the American Concrete Institute and the Distributors of Reinforcing Bars.

Sizes marked "*" carried in Duluth stock, Overnight shipment on all other sizes shown from factory warehouse makes it possible for us to offer a complete service on reinforcement never before enjoyed at the Head of the Lakes.

Size Round or Square	Area Sq. In.	Lbs. Per Ft.	Extra for Size Per 100 Lbs.
1 1/4" sq.	1.563	5.313	Base
* 1 1/8" sq.	1.266	4.303	Base
1" sq.	1.000	3.400	Base
* 1" rd.	.785	2.670	Base
* 7/8" rd.	.601	2.044	Base
* 3/4" rd.	.442	1.502	Base
* 5/8" rd.	.307	1.043	10c
* 1/2" sq.	.250	.850	20c
* 1/2" rd.	.196	.668	20c
* 3/8" rd.	.110	.376	40c
* 1/4" rd. plain	.049	.167	\$1.00

Ask for Base Price or Lump Sum Bid delivered F.O.B., R. R. Station nearest your work.

Havemeyer Bars have a uniform area of cross-section and are the same weight per foot as plain bars.

Our Reinforcing Bar Engineering Service

Through our connection with the manufacturers of Havemeyer Bars we are enabled to offer the services of a staff of experienced engineers who assist the trade on their reinforcing problems. Lump sum or pound price quotations are made direct from Engineer's or Architect's plans. When material is ordered we furnish setting diagrams, bar lists and any details which may be required.

Bending — — Fabricating

We are equipped to cut and bend bars to any desired shape, to form beam, joist and slab rods, stirrups, ties, hoops, etc.

For Warehouse shipment (24 hours notice) we supply machine made column spirals.

It will pay you to order your reinforcing complete ready for the forms.

Placing

Our Reinforcing Bar Service includes a Complete Line of placing accessories illustrated on the following pages. The use of these products will save you money.

Grades of Steel

Havemeyer Deformed Bars may be obtained in any of the three standard grades as shown in the following table:—

Grade	Elastic Limit	Ultimate Strength	% of Elongation
Structural	33,000	55-70,000	1,250,000 T. S.
Intermediate	40,000	75-85,000	1,125,000 T. S.
Hard	50,000	80,000 Min.	1,000,000 T. S.

The hard grade steel will carry a greater stress before failure than will intermediate or structural, but is more brittle than are the softer steels.

Our Duluth stock is intermediate grade which meets State and County Specifications, and those of the American Society for Testing Materials, Serial Designation A - 15 - 14.

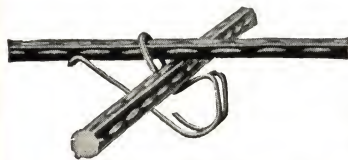
Road Engineers

If not already in your files ask for copy of "Havemeyer Bar Reinforcement for Concrete Pavements."

A postal card will bring your Copy.

Reinforcing Bar Placing Accessories

HAVEMEYER TY-CHAIR



Made from Spring Steel Wire, 1000 in a carton.

Standard distance from underside of bar to form is 1 inch. Special spacing minimum $\frac{3}{4}$ "; maximum 2", made up on order.

No. 2 . Takes bars $\frac{1}{4}$ " x $\frac{3}{8}$ " to $\frac{3}{8}$ " x $\frac{1}{2}$ ".

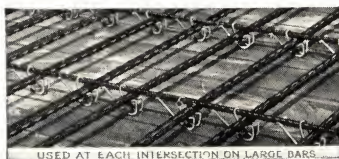
No. 3A. Takes bars $\frac{1}{2}$ " x $\frac{1}{2}$ " to $\frac{1}{2}$ " x $\frac{3}{4}$ ".

No. 3 . Takes bars $\frac{5}{8}$ " x $\frac{5}{8}$ " and $\frac{5}{8}$ " x $\frac{3}{4}$ ".

No. 4 . Takes bars $\frac{3}{4}$ " x $\frac{3}{4}$ " to $\frac{7}{8}$ " x 1".

In ordering, give sizes and type of bars on which Ty-Chair is to be used.

First fraction always designates the bar to which device is to be locked.

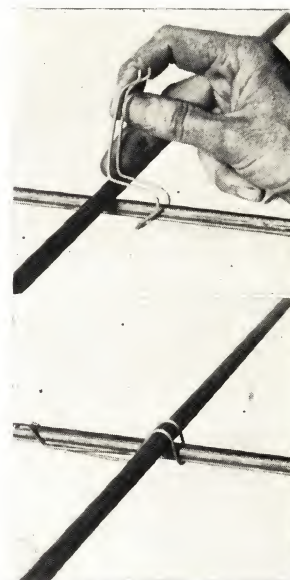


HAVEMEYER NO. 1. BAR TY

Made from Spring Steel Wire, Packed 1000 to the carton.

A	B
$\frac{3}{8}$ " x $\frac{3}{8}$ "	$\frac{1}{4}$ " x $\frac{5}{8}$ "
$\frac{1}{4}$ " x $\frac{3}{8}$ "	$\frac{3}{8}$ " x $\frac{1}{2}$ "
$\frac{1}{4}$ " x $\frac{1}{2}$ "	$\frac{3}{8}$ " x $\frac{5}{8}$ "
	$\frac{1}{2}$ " x $\frac{1}{2}$ "
C	D
$\frac{5}{8}$ " x $\frac{3}{4}$ "	$\frac{3}{4}$ " x $\frac{3}{4}$ "
$\frac{5}{8}$ " x $\frac{5}{8}$ "	$\frac{3}{4}$ " x $\frac{7}{8}$ "
$\frac{1}{2}$ " x $\frac{3}{4}$ "	$\frac{3}{4}$ " x 1"
$\frac{1}{2}$ " x $\frac{5}{8}$ "	

In ordering give size and type of bars on which Bar Ty is to be used. First fraction always designates the bar to which the device is to be locked.



HAVEMEYER NO. 2. BAR TY



Made from Spring Steel Wire. Packed 1000 to the carton. Used for tying bars in walls, slab bars to supporting rods over column heads and bent up bars in slab over direct beams, in flat slab, or over beams in beam and girder. For tying bands or hoops to vertical Column Steel and stirrups to beam bars.

In ordering state size and type of bars on which Ty is to be used. First fraction designates bar to which the device is to be locked.



HAVEMEYER EASEL-CHAIR

Single or double spacing made from Spring Steel Wire. Packed 500 to the carton.

Used for supporting and spacing bars in joist between steel or clay tiles.

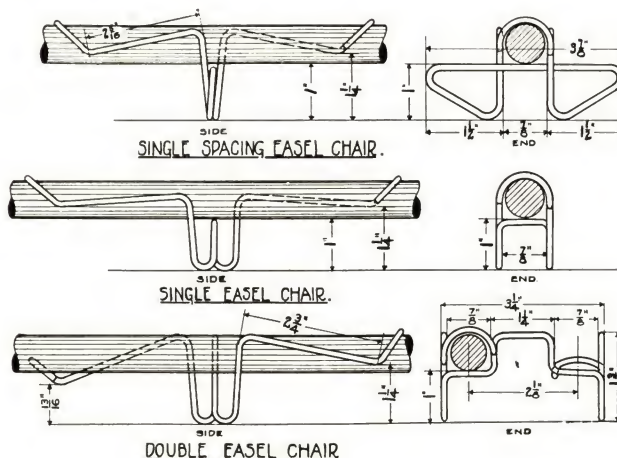
Standard distance underside of bar to form is 1" Special heights, min. $\frac{3}{4}$ " Max. 2" and widths can be furnished.

In ordering state type and sizes of bars maximum size bar for standard is $\frac{3}{4}$ ".

Standard Sizes—based on Havemeyer Deformed Bars.

$\frac{3}{8}$ " x $\frac{3}{8}$ "	$\frac{5}{8}$ " x $\frac{3}{4}$ "
$\frac{3}{8}$ " x $\frac{1}{2}$ "	$\frac{1}{2}$ " x $\frac{7}{8}$ "
$\frac{3}{8}$ " x $\frac{5}{8}$ "	$\frac{1}{2}$ " x 1"
$\frac{1}{2}$ " x $\frac{1}{2}$ "	$\frac{5}{8}$ " x 1"
$\frac{1}{2}$ " x $\frac{5}{8}$ "	$\frac{3}{4}$ " x $\frac{3}{4}$ "
$\frac{1}{2}$ " x $\frac{3}{4}$ "	$\frac{3}{4}$ " x $\frac{7}{8}$ "
$\frac{5}{8}$ " x $\frac{5}{8}$ "	$\frac{3}{4}$ " x 1"

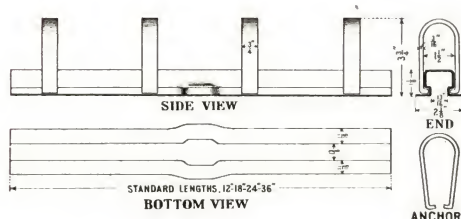
Number 2 Bar Tys can be furnished on special order from New York Factory for Larger size bars than shown in above list.



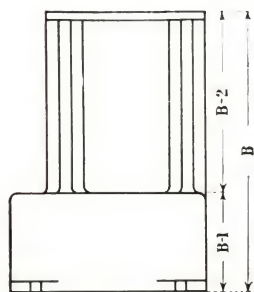
INSERTS

All of these inserts will meet the most exacting requirements of the Engineers as to strength, quality and service. They are desirable for the Contractor, because they have at least four easily accessible nailing holes, which allow quick attachment to the forms and prevent displacement during concreting. For the Owner, these inserts are permanently safe and economical, as they are all one piece, simply insert the bolt and the insert is ready for use.

HAVEMEYER SLOTTED INSERT



Made from highest grade 15 gauge steel in 12", 18", 24" and 36" lengths. Anchors are 3/16" steel 3/4" wide. These "U" anchors are adjustable in position. Six nailing holes prevent displacement. The removable end caps and the closed slot prevent seepage of concrete to the inside. Removal of the end caps allows the inserts to be placed end to end for a continuous run and a "U" anchor may straddle the lap joint.



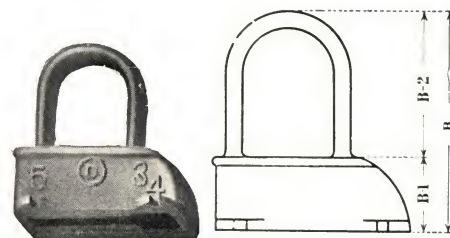
*Dayton No. 3
Adjustable*

DAYTON MALLEABLE INSERTS

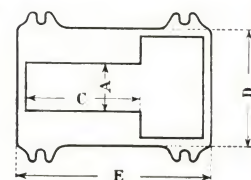
For a heavy, solid, strong, reliable insert our No. 3 is the leader.

Both the No. 3 and No. 5 are solid one piece units, made from carefully moulded malleable iron — for many years the standard malleable insert.

Made for various sizes of bolts—see table below. The keyhole slot not only allows adjustment but also allows the bolt to be readily inserted or replaced.



*Dayton No. 5
Adjustable*



DIMENSION TABLE FOR DAYTON INSERTS

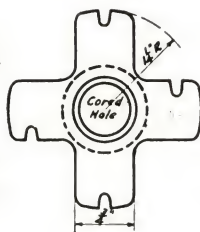
	Bolt Size	A	B	B-1	B-2	C	D	E	Weight
No. 3 Insert	1/4"	5/16"	2 1/4"	1 1/2"	1 3/4"	1 3/8"	3/4"	2"	1/4 lb.
	1/2"	9/16"	3 1/4"	3/8"	2 3/8"	2"	1"	2 7/8"	3/4 lb.
	5/8"	1 1/16"	3 3/4"	1 1/4"	2 1/2"	2"	1 1/2"	2 7/8"	1 1/4 lb.
	3/4"	1 3/16"	4 1/4"	1 3/8"	2 5/8"	1 3/4"	1 3/4"	2 7/8"	1 1/2 lb.
	7/8"	1 5/16"	4 3/8"	1 3/4"	2 5/8"	1 7/8"	1 7/8"	3"	1 3/4 lb.
No. 5 Insert	1/4"	7/16"	2"	5/8"	1 3/8"	1 3/8"	3/4"	2 1/8"	1/4 lb.
	3/8"	9/16"	2 3/8"	3/4"	1 5/8"	1 1/2"	1"	2 3/8"	1/2 lb.
	1/2"	1 1/16"	2 3/4"	7/8"	1 7/8"	1 5/8"	1 1/4"	2 5/8"	3/4 lb.
	5/8"	1 3/16"	3 1/8"	1"	2 1/8"	1 3/4"	1 1/2"	2 7/8"	1 lb.

HAVEMEYER "Y" SOCKET INSERT

The standard where no adjustment is necessary. Made from highest grade malleable iron, with tapped hole to carry standard threaded 3/8", 1/2", 5/8" and 3/4" bolts. The broad base with four nailing holes insures the Insert against displacement.

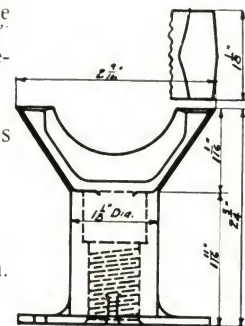
The tapping is even permitting easy access of the bolt.

The broad flared anchors furnish an excellent bond.

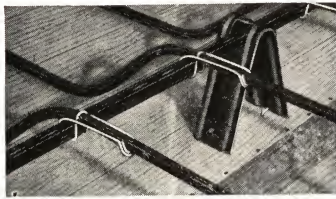


Furnished in four sizes
3/8", 1/2", 5/8", 3/4".

Weight about 3/4 lb. each.



Reinforcing Bar Placing Accessories

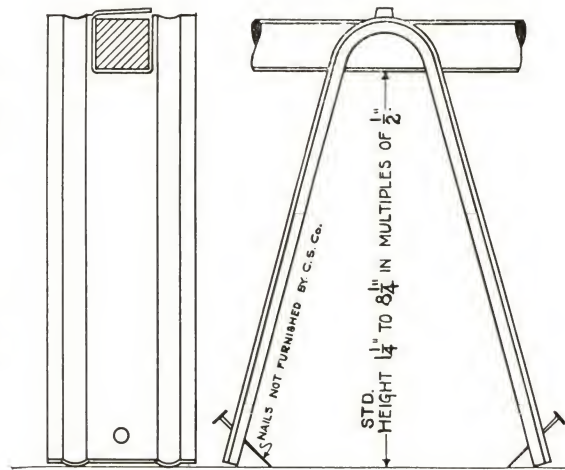


HAVEMEYER HY - CHAIR

Made from 18 gauge sheet steel. Used for holding supporting rods which carry bent up bars over column heads and over direct bands in flat slab. Or for holding upper layer of steel when layers occur in the slab.

Standard sizes of Hy-Chairs are from $1\frac{1}{4}$ " to $8\frac{1}{4}$ " inclusive. Can be made for any height. Factory will not guarantee over $8\frac{1}{4}$ " height.

Maximum Supporting rod that standard Hy-Chair will take is $\frac{3}{4}$ " inch.



Standard Heights Inches	Weight per 100.	Price per 100.
1½	35 lb.	Quoted on application
2	40 lb.	
2½	45 lb.	
3	50 lb.	
3½	55 lb.	
4	60 lb.	
4½	65 lb.	
5	70 lb.	
5½	75 lb.	
6	80 lb.	
6½	85 lb.	
7	90 lb.	
7½	95 lb.	
8	100 lb.	
Crated for shipment		

HAVEMEYER BEAM-SADDLE & SEPARATOR

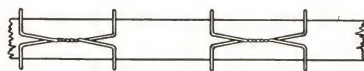


HAVEMEYER X - TENSION - CLIP

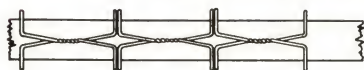
Used for fireproofing steel beams, girders, column, etc. Made from Spring steel wire. Packed 500 to the carton.

No. 1—3" to 6" Flange
No. 2—7" to 10" Flange

APPLICATION, N°1. SPACED 12 INCHES, END TO END
Formula: — One lineal foot of beam = $\frac{1}{2}$ clip.



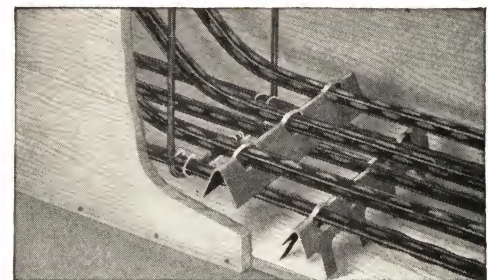
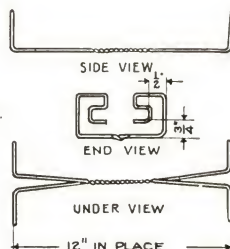
APPLICATION, N°2. PLACED END TO END.
Formula: — One lineal foot of beam = one clip.



APPLICATION, N°3. LAPPED CENTER TO CENTER
Formula: One lineal foot of beam = one clip.



X-TENSION CLIPS.



Made from 18 gauge sheet steel. Used in lintels, beams and girders for supporting, spacing and locking bars.

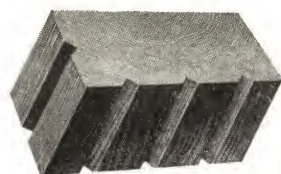
Type—A—For bars $\frac{3}{4}$ " or $\frac{7}{8}$ ".
Minimum Spacing $1\frac{7}{8}$ ".

Type—B—For bars 1"— $1\frac{1}{8}$ "— $1\frac{1}{4}$ ".
Minimum Spacing $2\frac{1}{2}$ ".

Standard Heights $1\frac{1}{2}$ " to 2" from bottom of bar to forms for saddle, 1" between bars for separator. Both made $\frac{1}{2}$ " short of actual beam width.

KREOLITE WOOD BLOCK FLOORS

"Outlast the Factory"



Kreolite Grooved Block

Standard Groove and Kountersunk Lug Blocks

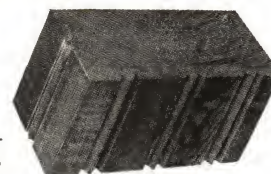
As the soil is the producing part of a farm so the floor is the producing part of every factory.

Kreolite floors, manufactured from thoroughly air seasoned, long leaf, yellow pine are laid with the tough end grain uppermost, forming a floor two to four inches thick. Once installed your flooring problems are permanently at an end.

The blocks are protected from decay and wear by the Kreolite Process (combined pressure and vacuum) whereby each cubic foot of timber is thoroughly impregnated with not less than 6 lbs. Kreolite Oil. (Greater amounts are used where required.)

sometimes destroyed by breakage caused by individual blocks becoming loose, permitting the penetration of foreign matter

between the blocks which eventually sifts down between the blocks and the base. Water penetrating the surface of the pavement under such conditions pockets below the blocks and causes excessive expansion and subsequent buckling and disruption of the surface. Sand and dirt penetrating to the under side of the blocks results in an uneven bearing for the blocks, causing them to fail by shearing under heavy loads.

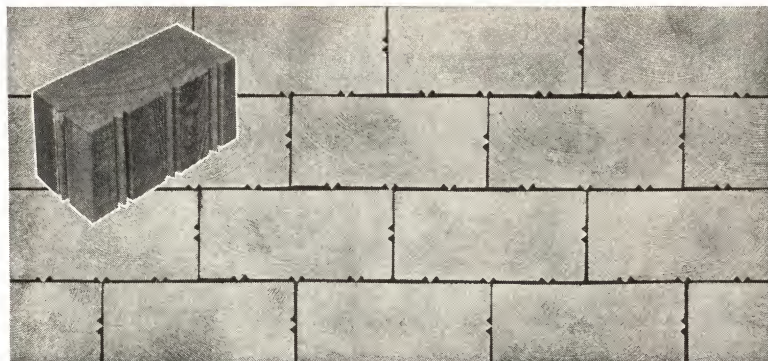


Kreolite Kountersunk Lug Block

KREOLITE GROOVED BLOCKS

These blocks are designed especially for dry interior floors, street pavements and bridges where shrinkage of the blocks is liable to occur and where it is essential that the blocks be driven tightly together at the time of installation. If any shrinkage does take place the filler flows laterally from the grooves which serve as reservoirs, thereby compensating for the increased strain imposed by the widened joint. Furthermore the filler is continuous with the coat of Kreolite Bitumen applied over the base and thereby keys the blocks firmly to the foundation.

The grooves are placed on the side of the block tangent to the growth rings so that they will break the continuity of the longest annual rings of the wood; they thereby break the periphery of the growth rings and reduce the tension and the effect of shrinkage.



Plan View of Kreolite Kountersunk Lug Blocks

Kreolite Block floors are the foundation of successful production in all lines of business: Machine shops, foundries, warehouses, bakeries, paper mills, tanneries, round-houses, stables, etc.

Groaning loads or crushing impacts simply compress the wood fibers, making the blocks tougher and stronger.

Through the Patented Grooves, the Kreolite Filler binds the blocks together into a unit of strength, making a floor that is warm, resilient and easy on workmen's feet. Wear—tear—heat—cold—moisture—acids—no matter what the need in your factory, Kreolite floors meet it.

You can resurface old or worn floors with Kreolite Blocks without interfering with production.

Wood block floors and pavements, even when constructed of the old style common rectangular blocks, seldom wear out from abrasion incidental to traffic, but are

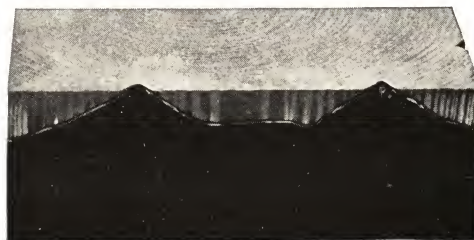
KREOLITE KOUNTERSUNK LUG BLOCKS

These blocks are designed for street and bridge paving and wet factory floors. The "V" shaped Kountersunk lugs provide individual expansion joints between the blocks, thereby preventing bulging, slipping and bleeding. At the same time the Kountersunk lug permits penetration of the filler the entire depth of the block, keying it securely to the base and making a firm waterproof joint. The block cannot become loose because it is firmly attached to the adjacent blocks on four sides and the base on the fifth, thus leaving only the top side exposed to moisture. The initial cost of a Kreolite Kountersunk Lug Block pavement is higher than that of a common rectangular block pavement because the design requires the use of a large amount of this very essential bituminous filler.

Specifications for application of Kreolite Wood Block Floors over any desired base gladly sent on request. We will quote an Blocks f.o.b. your R. R. Station or submit bid on Kreolite floors installed. Write us about your requirements.



Plan View of Kreolite Grooved Blocks



Showing Penetration of Filler with Kreolite Grooved Blocks

Majestic Coal Windows

Costs You No More to Have the Best

THE Majestic Coal Window protects the entire opening and side wall when coal is delivered, giving greatest protection above the window where it is most needed. Hence, it increases the value of the property, lessens depreciation and saves money.

There are styles and sizes for every type of house or building—all made of CERTIFIED MALLEABLE IRON AND KEYSTONE COPPER STEEL, Guaranteed Break-proof—superior in quality, design and workmanship at no additional cost. All styles are self-locking and burglar-proof. Residence styles have chain to latch for unlocking window from any part of basement or from room above.

PRESSED STEEL DOOR STYLES

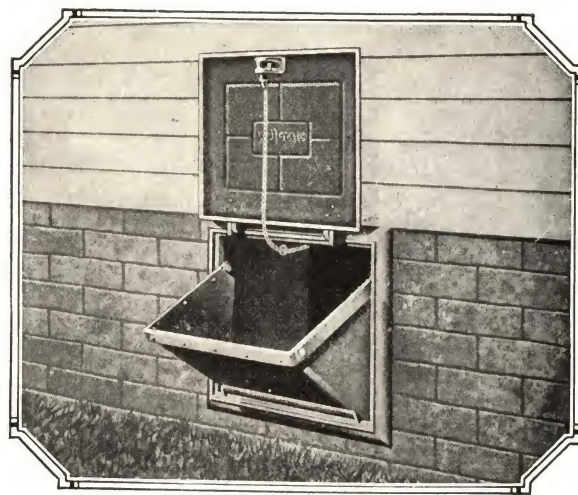
THE No. M101 MAJESTIC is the last word in coal window construction. The frame and hinges are of Certified Malleable Iron—break-proof! The door is of heavy, pressed Keystone Copper Steel—break-proof! The body is also of Keystone Copper Steel (12" deep with sloping bottom) re-inforced with angle iron at top to carry masonry. Equipped with chain to latch. Style B has a hopper which prevents scattering of coal. Style D is without hopper. The No. M203 Majestic is the same as the No. M101, but larger in size.

THE No. M500 MAJESTIC is the biggest value ever offered in a coal window. It is the same size and made of the same quality materials as the No. M101, but with a 9" straight bottom body, without hopper and without chain to latch. The No. M520 is the same as the No. M500, but larger in size.

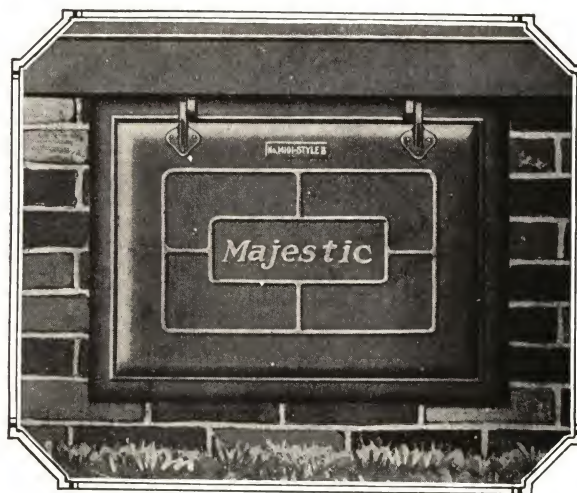
Sizes of Steel Door Styles MAJESTIC COAL WINDOWS

No.	Style	Wall Opening			Shipping Weight	List Price
		Wide	High	Deep		
M101	P	24"	17"	12"	52	12.00
M101	D	24"	17"	12"	41	10.50
M203	B	33"	22"	17"	105	24.00
M203	D	33"	22"	17"	84	21.30
M500	.....	24"	17"	9"	35	9.00
M520	.....	33"	22"	12"	70	18.00

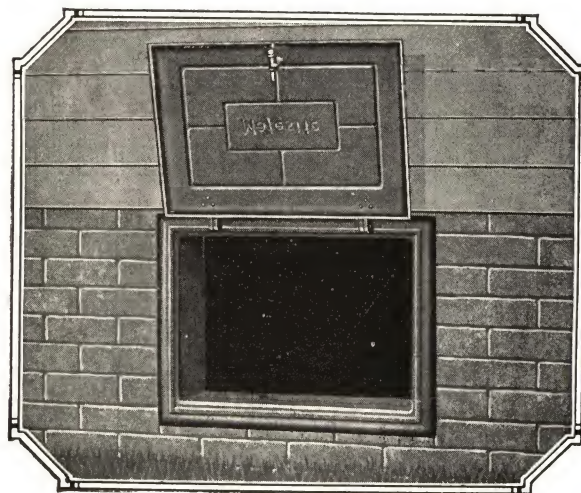
(Style B is with Hopper—Style D without Hopper)



NOS. M101 AND M203 OPEN



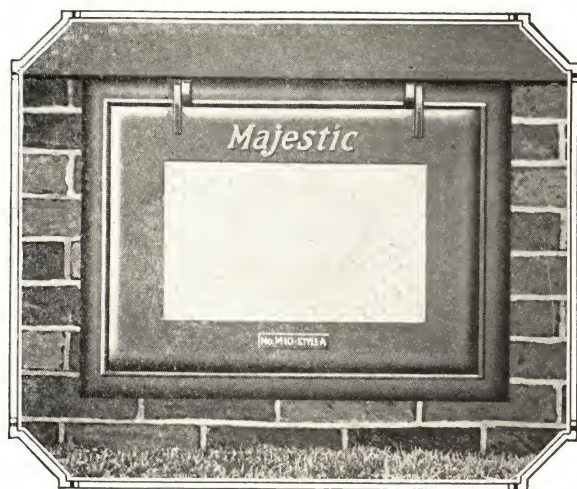
NOS. M101 · M203 · M500 · M520 CLOSED



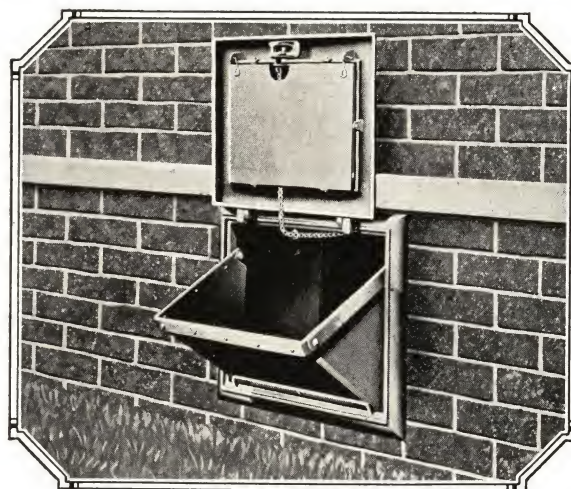
NOS. M500 AND M520 OPEN

All Styles in Duluth Stock for Immediate Shipment

Majestic Coal Windows

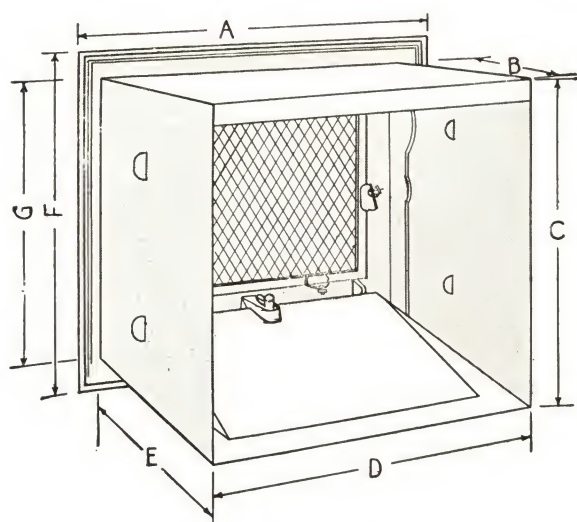


NOS. M10 · M20 · M600 · M620 CLOSED



NOS. M10 · M20 OPEN

When Daylight is Desired in the Coal Bin



Complete Dimensions of
MAJESTIC COAL WINDOWS
All Styles and Sizes
(All Dimensions in Inches)

No.	A	B	C	D	E	F	G
M101	25	12	18	21 $\frac{3}{4}$	12	19	16
M203	33	17	24 $\frac{1}{2}$	30	17	23 $\frac{1}{2}$	20 $\frac{3}{4}$
M500	25	9	15 $\frac{1}{2}$	21 $\frac{1}{2}$	9	19	15 $\frac{1}{2}$
M520	33	12	20 $\frac{1}{2}$	30	12	23 $\frac{1}{2}$	20 $\frac{1}{2}$
M 10	25	12	18	21 $\frac{3}{4}$	12	19	16
M 20	33	17	24 $\frac{1}{2}$	30	17	23 $\frac{1}{2}$	20 $\frac{3}{4}$
M600	25	9	15 $\frac{1}{2}$	21 $\frac{1}{2}$	9	19	15 $\frac{1}{2}$
M620	33	12	20 $\frac{1}{2}$	30	12	23 $\frac{1}{2}$	20 $\frac{1}{2}$

(Letters in table correspond with letters on drawing above.)

THE No. M10 MAJESTIC Coal Window is used when daylight is desired in the coal bin. It has Certified Malleable Iron door, frame and hinges—and a copper steel body (with a 12" sloping bottom), re-inforced with angle iron at top to carry masonry. The door is fitted with $\frac{1}{4}$ " wire glass panel, protected by a steel shield when open. When closed, the shield lies flat in the bottom. Equipped with chain to latch. Style A has a hopper which prevents scattering of coal. Style C is without hopper.

THE No. M20 MAJESTIC is the same as the No. M10, but larger in size. The No. M600 is another glass panel style. It is the same size and made of the same quality materials as the No. M10, but with 9" straight bottom body without hopper and chain. The No. M620 is the same as the No. M600, but larger in size.

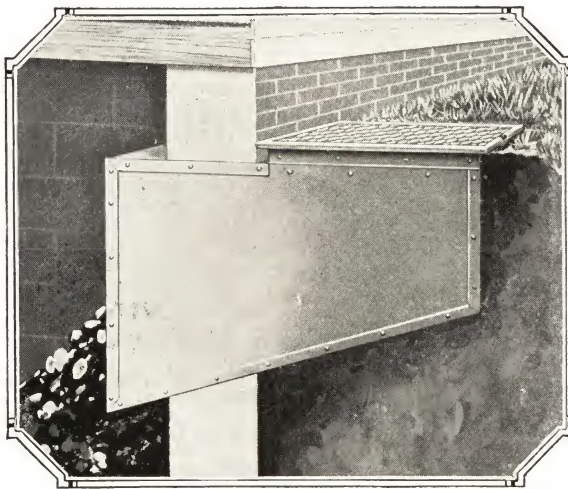
Sizes of Glass Panel Styles
MAJESTIC COAL WINDOWS

No.	Style	Wall Opening			Shipping Weight	List Price
		Wide	High	Deep		
M 10	A	24"	17"	12"	63	15.75
M 10	C	24"	17"	12"	52	14.25
M 20	A	33"	22"	17"	120	30.00
M 20	C	33"	22"	17"	100	27.30
M600	.....	24"	17"	9"	45	13.20
M620	.....	33"	22"	12"	88	25.80

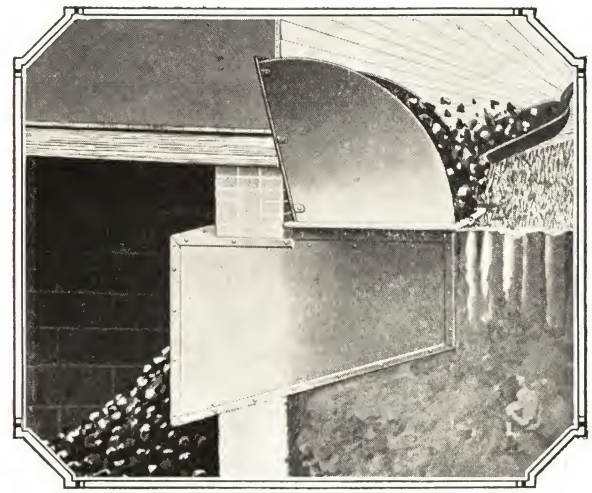
(Style A is with Hopper—Style C without Hopper)

All Styles in Duluth Stock for Immediate Shipment

Majestic Grade Line Chutes

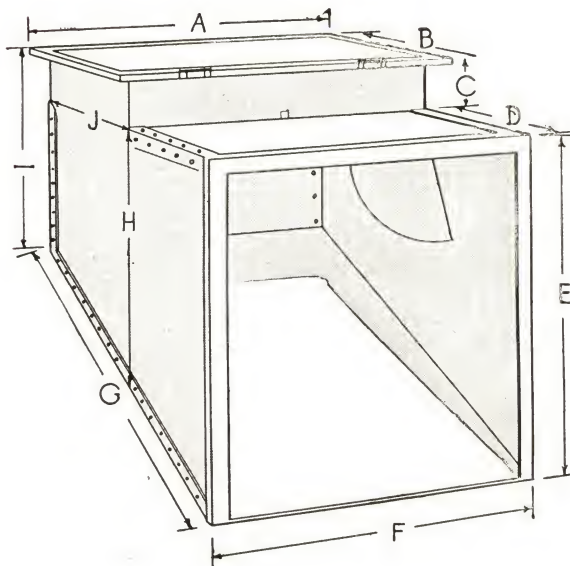


MAJESTIC GRADE LINE COAL CHUTE CLOSED



MAJESTIC GRADE LINE COAL CHUTE OPEN

For Buildings with Low Foundations



Complete Dimensions
MAJESTIC GRADE LINE CHUTES
(All Dimensions in Inches)

No.	A	B	C	D	E	F	G	H	I	J
M16	26 $\frac{1}{4}$	21	4	16	24 $\frac{3}{4}$	24 $\frac{1}{2}$	36 $\frac{1}{2}$	19	16 $\frac{1}{4}$	19 $\frac{1}{2}$
M18	32	27	4	17	31	30	45	24	19 $\frac{1}{2}$	25 $\frac{1}{2}$

Letters in table correspond with letters on drawing above.

THE Majestic Grade Line Coal Chute is designed for installation in buildings with little or no foundation above the ground—such as low-set or terraced homes, apartments, store and office buildings. The door swings upward—and when raised, it forms part of the hopper and becomes a shield which protects the building when coal is delivered.

The frame is made of Certified Malleable iron. The door is of heavy wrought steel floor plate, diamond surfaced. The hinges are also of Certified Malleable Iron with solid brass hinge pins. The body is of Keystone Copper Steel, re-inforced with angle iron. A break-proof construction throughout. Water drainage grooves under the door prevent any water from getting into the basement.

Sizes of MAJESTIC GRADE LINE CHUTES

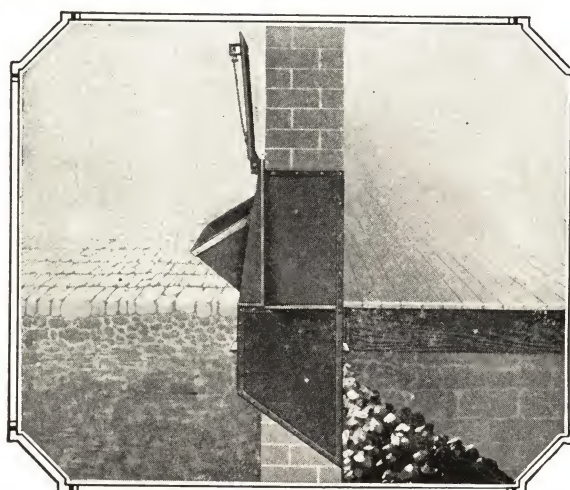
No.	Door Opening	Wall Opening		Shipping Weight	List Price
		Wide	High		
M16	24" x 18"	25"	25"	145	33.00
M18	30" x 24"	31"	31"	212	48.00

All Sizes in Duluth Stock for Immediate Shipment

Majestic Store Coal Chute

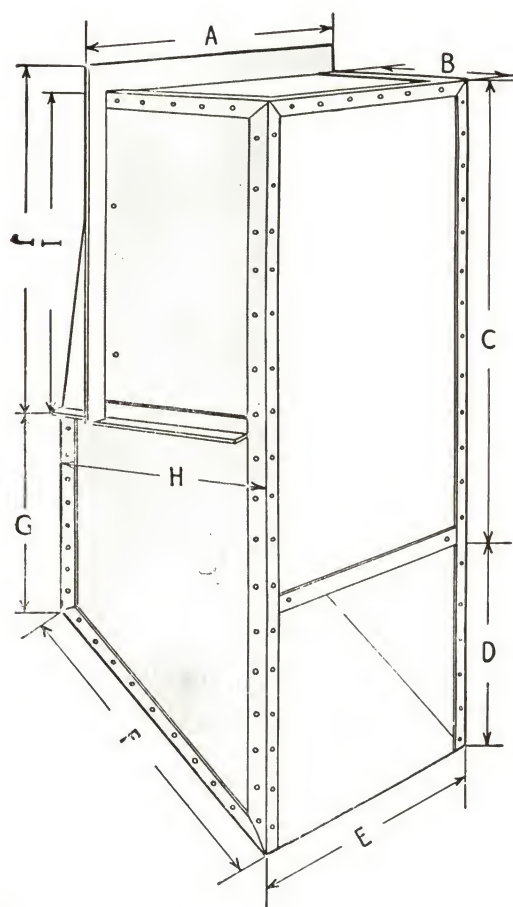


MAJESTIC STORE COAL CHUTE CLOSED



MAJESTIC STORE COAL CHUTE OPEN

For Store and Office Buildings



THE Majestic Store Coal Chute is designed particularly for store and office buildings, where the first floor is on a line with the sidewalk or alley. It does away with the dangerous sidewalk coal hole and the necessity for putting up a bond for the protection of pedestrians.

The frame and hinges are of Certified Malleable Iron. The door is of heavy wrought steel floor plate, diamond surfaced. Made in two sizes, with or without hopper. On special order, the Store Chute can be supplied with a duplex body so that coal can be deposited either under the sidewalk or in the basement as desired.

Sizes of MAJESTIC STORE CHUTES

No.	Door Opening	Wall Opening		Shipping Weight
		Above Grade	Below Grade	
M12	22" x 20"	24" x 21"	24" x 26"	136
M15	30" x 24"	31" x 25"	31" x 26"	185

Complete Dimensions MAJESTIC STORE CHUTES (All Dimensions in Inches)

No.	A	B	C	D	E	F	G	H	I	J
M12	25 $\frac{3}{4}$	12 $\frac{1}{2}$	31 $\frac{1}{4}$	15	23	20 $\frac{1}{2}$	13 $\frac{1}{2}$	16 $\frac{1}{4}$	21	22 $\frac{1}{2}$
M15	33 $\frac{1}{2}$	12 $\frac{1}{2}$	33 $\frac{1}{2}$	17 $\frac{1}{4}$	31	20 $\frac{1}{2}$	13 $\frac{1}{2}$	16 $\frac{1}{4}$	25	26

Letters in table correspond with letters on drawing at the left.

LIST PRICES

M12—With hopper—\$33.00 Without hopper—\$31.50
M15—With hopper—\$48.00 Without hopper—\$45.30

All Sizes in Duluth Stock for Immediate Shipment

FIRE PLACE DAMPERS

The wide flanges at the side allow considerable freedom in arranging the angle of the side walls of the fireplace. The wide front flange will support the front course of brick. We always recommend, however, the use of a steel angle to carry this opening and setting the damper up about two courses.

The damper door is center-pivoted and operated by a worm. While the cut shows the operating rod in the center, the dampers, unless otherwise specified, are furnished with the operating rod at the right side. By loosening a set screw the position of rod can be instantly adjusted without dislocating the worm. The knob is marked to show direction to turn and every damper carries full directions for placing.

Table of Dimensions. Standard Improved Fireplace Dampers

Damper No.	Front length In.	Rear Length In.	Depth In.	Front In.	Rear In.	Depth In.	Weight lbs.
150	30	25	13 $\frac{3}{4}$	24 $\frac{1}{2}$	21	10	30
160	34	29	13 $\frac{3}{4}$	28 $\frac{1}{2}$	25	10	34
170	38 $\frac{1}{2}$	33 $\frac{1}{2}$	13 $\frac{3}{4}$	33	28 $\frac{1}{2}$	10	39
175	42	37	13 $\frac{3}{4}$	36	32	10	42
180	44 $\frac{1}{2}$	39 $\frac{1}{2}$	13 $\frac{3}{4}$	39	35	10	44
185	47 $\frac{1}{2}$	42 $\frac{1}{2}$	13 $\frac{3}{4}$	42	38	10	48
190	54	49	13 $\frac{3}{4}$	49	45	10	61
200	60	55	13 $\frac{3}{4}$	55	51	10	73
210	78	73	13 $\frac{3}{4}$	72	68	10	80

In ordering Ratchet style dampers dimensions shown above apply— Use same numbers adding letter "R" for example No. 150-R is 30 in. damper with ratchet operating lever and bracket extended to work below 3 $\frac{1}{2}$ in. angle.



Dome damper with extended ratchet operator

These ratchet dome dampers have the same dome and doors as the improved damper but the cover is operated by a gravity locking lever. Occasionally it is not desirable to have the operating knob project through the face of the fireplace—for instance where marble or tile is used to face the mantel. The lever is located in the center so that when the top of the opening is arched, it is accessible. It does not extend beyond the face of the fireplace.

Note the long bracket and operating lever so that this style of damper can be used above a steel angle, the same as our improved damper.



FLAT RATCHET DAMPER

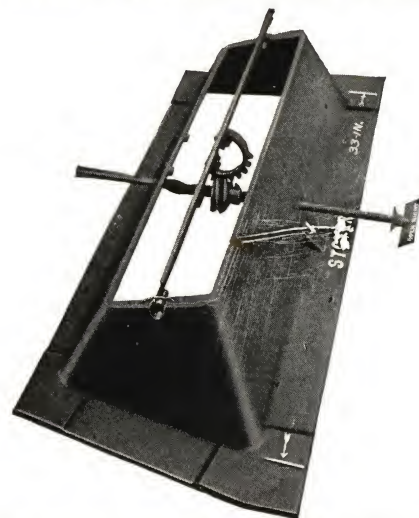
Made on same principle as the large ratchet dome dampers but has no dome.

TABLE OF DIMENSIONS — FLAT RATCHET DAMPERS

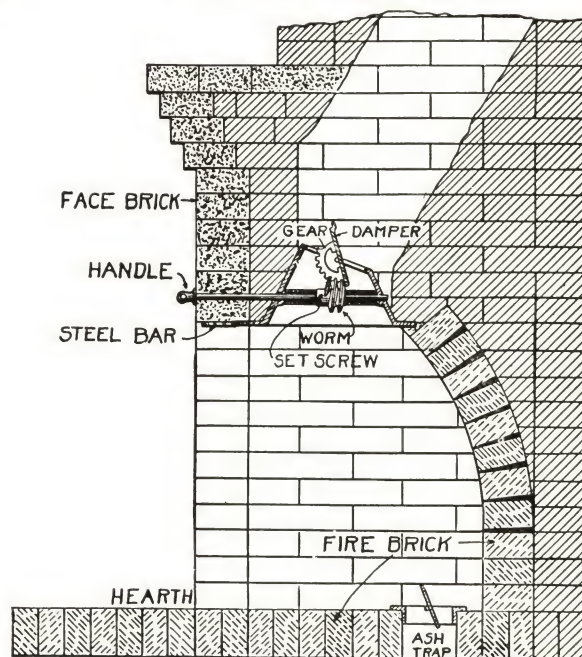
Damper No.	Front length In.	Rear length In.	Depth In.	Opening In.	Weight lbs.	List Price
300	24	21 $\frac{1}{2}$	10	17 x 6	13	Price on Application
310	28	25 $\frac{1}{2}$	10	21 x 6	18	
320	32	29 $\frac{1}{2}$	10	25 x 6	20	
330	37 $\frac{1}{2}$	34 $\frac{3}{4}$	10	29 x 6	27 $\frac{1}{2}$	
340	44	41 $\frac{1}{4}$	10	35 $\frac{1}{2}$ x 6	32	

Not carried in Duluth Stock.

Standard Improved Fire Place Damper and Throat



End view showing worm, segment, rod, etc. Notice wide Flanges on frame.



ASH PIT DOORS & FLUE CLEAN OUTS

CAST IRON
ASH PIT DOOR

Enameled Black, used at bottom of chimney to remove soot and ashes. Door fits flush into recessed frame and can be locked shut.

Anchor bolt holes in frame.

All sizes carried in stock.



Size of Opening	List Price	Weight Each, Approx.
8 x 8	\$14.70 doz.	8 lbs.
8 x 10	\$16.50 doz.	10 lbs.
10 x 12	\$23.25 doz.	13 lbs.
12 x 15	\$40.00 doz.	20 lbs.
16 x 20	\$60.00 doz.	32 lbs.

Prices shown are List—Ask for discounts applying.

Packed 6 doors in a crate—Open Stock—Any quantity or assortment can be furnished.

LIGHT WEIGHT FLUE CLEAN OUTS

A handy, light weight, pressed steel door and frame extensively used where our heavier cast iron ash pit doors are not deemed necessary. Door and frame are each machine pressed from heavy gauge steel sheet. Coated with bitumastic solution to prevent rusting. Hinges welded on.



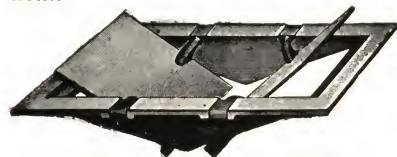
Size of Opening	Weight Each Approx.	List Price
6 x 8	3½ lbs.	\$10.20 doz.
8 x 10	5 lbs.	\$12.60 doz.
10 x 12	6½ lbs.	\$15.00 doz.

Prices shown are List—Ask for discounts applying.

Packed 6 doors in Carton—Open Stock—Any quantity or assortment of sizes can be furnished.

JOIST
ANCHORS

Strap steel with heavy Cast Iron washer on one end. Other end punched to allow spike to be nailed through into joist. 1½" x 24" anchor with 4" washer carried in stock, weight approximately 1¾ lbs. each. Other sizes up to ¼" x 2" and lengths to 30" furnished on short notice. Also anchors with steel pin instead of washer when desired. Ask for quotations.



AUTOMATIC ASH DUMP

Made of select gray iron. Doors well counter balanced and secured to frame. Doors cannot become lost in shipping or handling. Automatic style dumps when sufficient ashes accumulate on center and close automatically when load is dumped. Plain (single leaf) type is to be dumped by poker.

	Outside Dimensions of Plate	Opening in Plate	Weight	List Price
Automatic	7¾" x 9½"	5½" x 7¼"	4 lbs.	.55 ea.
Plain	7" x 9"	4¾" x 6¾"	2¼ lbs.	.66 ea.

Prices shown are List—Ask for discounts applying



MAJESTIC

MAN HOLE

DOORS

Frame is Cast Iron

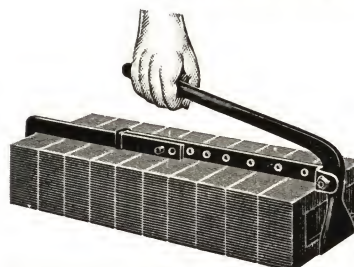
Door is 10 ga.

Copper Steel

Size	Shipping Weight	List Price
18" x 24"	44 lbs.	\$ 9.60 ea.
24" x 30"	60 lbs.	\$12.00 ea.
24" x 36"	65 lbs.	\$12.90 ea.

List Prices Subject to discount.

BRICK HANDLERS



The "Standard" brick handler is a labor saving device for handling brick. Quickly and easily adjusted to carry five to ten brick. Rigid and strong enough to handle street pavers.

Malleable iron throughout, Almost unbreakable.

Every contractor handling

brick should have a half dozen or more of these handlers. Price gladly quoted on request.

STEEL ANGLES

For carrying brick work over opening in fire places, window and door openings, etc. we are carrying in stock an assortment of steel angles cut to the short lengths we have found most in demand.

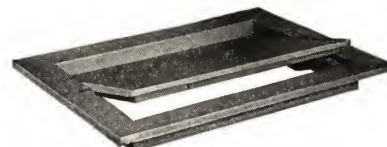
Send us your list for estimate.

The list below gives some of the most commonly wanted sizes, which we can usually furnish on short notice from Duluth warehouse stock.

Size of Angle	Thickness
6 " x 4 "	5/8" — 1/2" — 3/8"
6 " x 3 1/2 "	1/2" and 3/8"
5 " x 4 "	3/8"
5 " x 3 1/2 "	1/2" 3/8" — 5/16"
5 " x 3 "	3/8" and 5/16"
4 " x 3 "	1/2" 3/8" 5/16" 1/4"
3 1/2 " x 3 1/2 "	1/2" 3/8" 5/16" 1/4"
3 1/2 " x 3 "	1/2" 3/8" 5/16" 1/4"
3 1/2 " x 2 1/2 "	1/2" 3/8" 5/16" 1/4"
3 1/2 " x 2 1/2 "	1/2" 3/8" 5/16" 1/4"
3 " x 2 1/2 "	3/8" 5/16" 1/4"

Ash Dumps

To Receive Ashes from Fire Place Hearth



PLAIN ASH DUMP



The photograph gives some idea of the assortment of sizes in which our catch basin rings and covers can be supplied.

Coal Hole and Catch Basin RINGS and COVERS

We carry in stock a complete assortment of Catch Basin and Coal Hole Rings and Covers. See table of standard sizes and weights below.

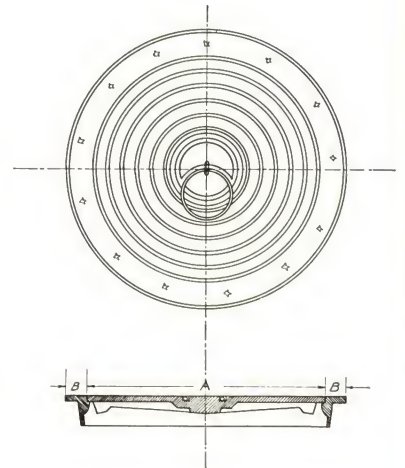
Special sizes and weights can usually be furnished on reasonable notice. When desired any of the styles shown can be supplied with perforated cover. Our sizes 18 inch and larger can also be equipped with locking device.

We will gladly quote on any special requirements.

Table of Sizes and Weights

SIZE Dimension A	Diameter Overall	DEPTH	APPROXIMATE WEIGHT	
			Standard Pat.	Extra Heavy Pat.
12 in.	17 in.	3 in.	25 lbs.	Not Made
14 in.	18 in.	1 in.	30 lbs.	Not Made
18 in.	21 in.	2 1/2 in.	40 lbs.	60 lbs.
20 in.	24 1/2 in.	3 in.	75 lbs.	115 lbs.
24 in.	29 in.	4 in.	95 lbs.	140 lbs.
30 in.	35 in.	3 1/4 in.	205 lbs.	315 lbs.

Dimensions shown apply to Standard Weight Pattern. In most sizes Extra Heavy Pattern is somewhat larger than shown. Write for prices on your requirements.



FLOOR DRAINS



Cast Iron, With Bell Trap

Regular style has loose strainer cover as shown. Can be furnished with hinged cover when required.

Size of Top Plate	Size Outlet	Weight	Price
6 x 6	2 in.	5 lbs.	Quoted
9 x 9	4 in.	13 lbs.	on
13 x 13	4 in.	24 lbs.	Application

Joist Hangers

We handle a complete line of joist hangers and post caps of various types for use in heavy mill construction, warehouses and factory buildings, as well as in ordinary joist construction.

Write us in regard to your requirements. Catalogue and prices gladly furnished.

Self Clinching Nails

FOR ATTACHING FURRING OR GROUNDS
TO HOLLOW FIREPROOFING

Our Self Clinching Nails are so constructed that when the shoulder, in driving, has reached the face of the furring strip it becomes stationary, while the driving stem, being movable, telescopes into the rest of the nail and forces the points apart, clamping them tight within the hollow part of the tile.

A decided advantage for these nails is the fact that after being driven they can be wedged out, up to 3/4 of an inch, without injuring the hold.

These nails are furnished in three standard sizes—

1 in. Nail (2 3/4 in. over all)—used for metal grounds or wooden strip not over 1/2 in. thick.

1 1/4 in. Nail (3 in. over all)—used for wooden strips 5/8 in., 3/4 in. or 7/8 in. thick.

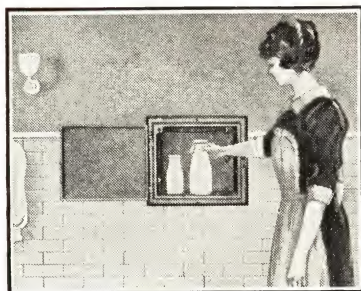
1 1/2 in. Nail (3 1/4 in. over all)—used for wooden strip 1 in. thick or greater.

Special punches are furnished to enable the use of these nails with hard burned tile.

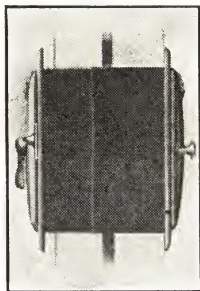
Ask us for samples and descriptive literature.

Majestic Garbage and Package Receivers

Package Receivers



Inside View—Removing Milk



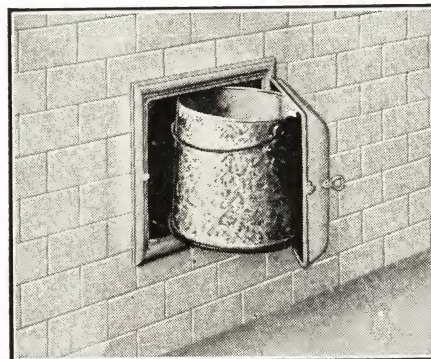
Sectional View

THE Majestic Milk and Package Receiver consists of two cast iron frames and doors, connected by a steel body. Both doors can be unlocked from the inside only. The outside door locks automatically when closed. Requires wall opening 14" by 12".

No.	For Wall Thickness	Ship. Wt.	Price
1	5" to 8"	46	\$11.10
2	8" to 14"	50	11.40

Prices shown are list and subject to discount

Apartment Garbage Receivers



THE No. 3A Majestic Apartment Garbage Receiver consists of a heavy cast iron frame and door—galvanized iron body which recesses in the wall—and a garbage can of 3 gallons capacity. The garbage pail sets on a cast iron shelf which is fastened to the door. Two heavy cast iron ventilators 4" by 2 1/4" are supplied with this receiver.

Shipping weight 36 pounds. Price \$7.50

Underground Garbage Receivers



At right is section through ground showing Majestic Underground Garbage Receiver buried and in use



THE Majestic Underground Garbage Receiver puts the garbage can out of sight—underground. Convenient, sightly, sanitary. Can be installed in a convenient place near your kitchen door—avoids walking to back fence. A slight pressure on the foot-trip raises the lid. Garbage is easily deposited and as easily removed. When the lid is closed, no odor is emitted.

Consists of a cast-iron top; a Keystone Copper Steel shell; and a galvanized garbage can—either a heavy plain can or an extra heavy Witt Corrugated can. The top, as shown in the illustrations, consists of a ring, lid and foot-lever. Coated with Bitumastic Solution.

No.	Can Capacity	Ship. Wt.		Price With	
		Plain	Witt	Plain Can	Witt Can
5	5 gal.	31	35	\$7.80	\$9.30
8	8 gal.	48	53	9.90	12.30
12	12 gal.	52	58	10.80	14.10
15	15 gal.	60	66	11.40	17.40
20	20 gal.	80	87	14.70	23.10

List prices subject to discount

ROOFING MATERIALS

In addition to our very complete lines of prepared roofings, building papers, asphalt shingles we also carry large stocks of the various materials required in pitch and gravel and in asphalt roof construction. Some of these items are enumerated below—

Tarred felt—No. 1, 2 or 3—weights approximately 48 pounds per roll.

Roofing Pitch—Straight run coal tar pitch—carried in wood barrels or sheet iron drums—average weight 500 to 600 pounds.

Roofing Gravel—Screened through 3/4 mesh—Sand and all particles under 1/4 inch removed. An excellent product.

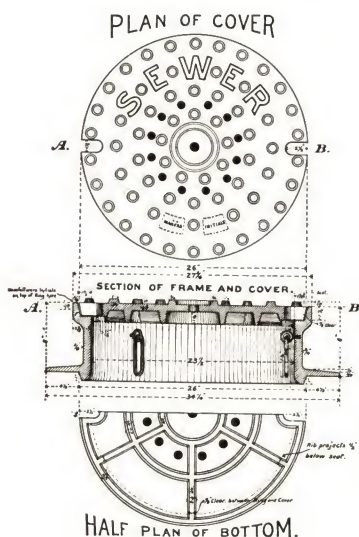
Asphalt Felt—1st quality felt in rolls—stock this in No. 2 (weighs 15 lbs.) and No. 30 (weighs 30 lbs.) per 100 sq. ft. Also for factory shipment, can supply No. 1 (20 lbs.) and No. 3 (12 lbs.)

Roofing Asphalt—Sheet iron drums—average weight 500 to 600 pounds.

These items together with our roofings and building papers—pages 78 and 79—can all be shipped in mixed car load lots—Ask for quotations delivered your city.



MANHOLE COVER NO. 14



Manhole Rings and Covers

We illustrate here two of the styles of manhole Rings and Covers which have been used extensively for some years in Northern Minnesota and Wisconsin.

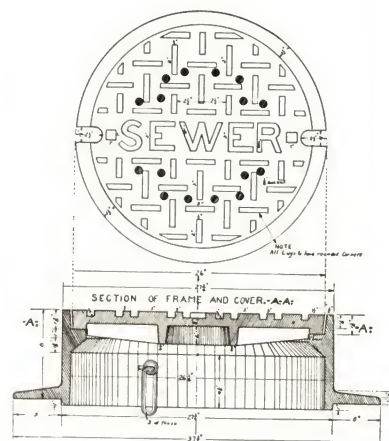
The half tone above and the cut in the lower left hand corner shows our No. 14 used for many years on all sewer construction in Duluth and many other cities in this section. This Ring and Cover is suitable for use in all street work except where the very heaviest traffic is to be expected. Weight is approximately 380 lbs. per set. Can also be furnished in 22 inch diameter (cut shows the 24 inch size). Weight of 22 inch pattern approximately 300 lbs.

Cut at right shows our number 21 Extra Heavy manhole Ring and Cover. This is made extra heavy in all dimensions and is designed to stand up under the heaviest traffic, and has been adopted as standard by the city of Duluth. Weight per set is approximately 560 lbs. The under surface of the cover and the shoulder on which it rests are machined so that the cover will lay absolutely flat and not rattle under traffic.

Both styles are provided with three rings to take our standard manhole bucket (described below) and whenever used in sanitary sewer construction should be so equipped.

Delivered prices on manhole and covers gladly quoted on application. If the manholes illustrated do not conform to your specifications, write us and send sketch of what you need.

No. 21 EXTRA HEAVY MANHOLE COVER



Manhole Buckets

Our standard Manhole Bucket is made up of 14 gauge metal, 15 inches in diameter at top—12 inches at bottom—9½ inches deep. It is fitted with heavy iron bail and three hooks so that it can be hung in the rings provided in either of our manhole rings and covers illustrated above.

After manufacture they are coated with a heavy coat of asphaltum paint, so that they should last indefinitely.

This style is standard in Duluth and most other cities in this section. Shipping weight is approximately 13 pounds.

Cast iron pans can be furnished when required by specifications. Send sketch or blue print and we will gladly quote prices.

STEPS

Manhole Steps are bent to detail from 5/8 inch or 3/4 inch round steel. Our facilities for bending reinforcing bars (see page 82) enable us to turn out any desired amount of steps on short notice.

Send sketch or print and we will gladly quote prices.

Manhole Brick

We carry in stock a special run of hard burned sand mould brick suitable for manholes and sewers (none other than well burned, sand mould, clay brick should ever be used for manhole work) and will gladly quote delivered prices on car lots at railroad station nearest your work. Write for quotations.

Lamp Hole Covers

We are in position to furnish these in several styles and sizes and will gladly quote on receipt of sketch or blue print.



Monument Box

Cut illustrates standard Monument Box as used by the City of Duluth.
Size of Opening 7"x 7"
Bottom Dim. 13"x13"
Height 9 1/4"
Metal 1/2" thick

Sewer Joint Compound

Often sewers must be laid below the level of nearby water courses. The use of a water-tight sewer joint compound to prevent infiltration is of primary importance. Our compounds are non-porous, flexible, adhesive and waterproof and easily laid like lead joints in cast iron pipe.

Will gladly send descriptive literature and quotations on request. Write us in regard to your requirements.

INTAKES



CORNER CURB INTAKE

Extreme Width	55 in.
Radius	20 in.
Diameter of Cover	30 in.
Height Over All	12 in.
Weight	500 lbs.

We illustrated here two of the standard types of curb intakes we are in position to supply on short notice.

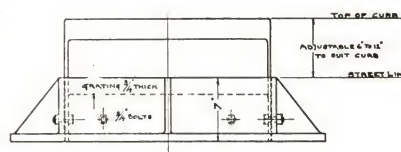
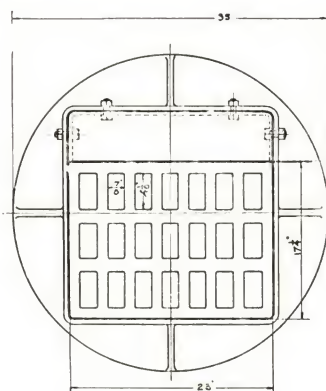
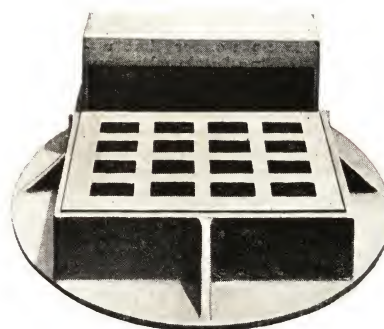
The adjustable type illustrated on the right meets the requirements of most jobs.

We can supply other styles in addition to the ones shown and invite your inquiries of these types will not take care of your needs.

SIDE CURB INTAKE

Adjustable for varying heights of curb.

Illustrated with 16 hole grate. Standard pattern has 21 holes as shown in detail drawing below.



SEWER GRATINGS

Sewer Gratings are for the purpose of draining Street Gutters into Catch Basins and thence into the Storm Sewer. A number of the sizes of gratings shown in the attached table can be furnished with rectangular cast iron frames. The No. 20 Grating is the style used with the Side Curb Intake shown at the top of page. No. 2, 5 and 10 are the Standard City of Duluth patterns. Other sizes than shown in the table can be supplied if required. Prices will be gladly quoted on application.

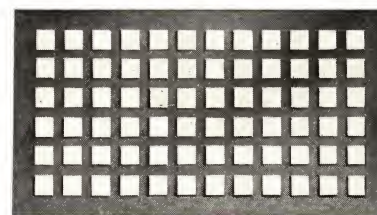


TABLE OF SIZES AND WEIGHTS

GRATING NO.	OUTSIDE DIMENSIONS	NUMBER OF HOLES	SIZE OF HOLES	WEIGHT POUNDS
2	30 in. x 32 in.	120	2 1/8 in. x 2 1/8 in.	185
5	23 1/4 in. x 29 in.	80	2 in. x 2 in.	111
10	20 in. x 36 in.	72	2 in. x 2 in.	132
12	40 1/4 in. x 40 in.	121	2 1/2 in. x 2 1/2 in.	315
15	24 in. x 32 in.	88	1 3/4 in. x 1 3/4 in.	116
18	21 in. x 29 in.	70	1 3/4 in. x 1 3/4 in.	98
20	17 1/2 in. x 22 1/2 in.	21	2 in. x 4 in.	89
21	15 1/2 in. x 15 1/2 in.	20	1 1/2 in. x 2 in.	61
24	12 in. x 16 in.	20	1 3/4 in. x 2 in.	35
25	12 in. x 12 in.	16	1 3/4 in. x 1 3/4 in.	26

EXPANSION JOINTS - - For Concrete Pavements, Walks, etc.

Our Perfection preformed Expansion Joint has almost completely displaced the old poured joint.

We have distributed this material in Duluth and the surrounding territory for over twelve years and this brand has proved itself the most satisfactory ever manufactured for the purpose.

It is no wonder that up-to-date contractors refuse to fuss with the old tar kettle when our Perfection joint is better and the cost (labor considered) is no higher.

SHIPPING WEIGHTS

Thicknesses	Widths											
	3" lbs.	3½" lbs.	4" lbs.	5" lbs.	6" lbs.	7" lbs.	8" lbs.	9" lbs.	10" lbs.	11" lbs.	12" lbs.	
1/4 inch.....	34	40	45	57	68	79	91	102	113	125	136	
3/8 inch.....	51	60	68	85	102	119	136	153	170	187	204	
1/2 inch.....	68	79	90	113	135	158	180	203	225	248	270	
3/4 inch.....	105	123	140	175	210	245	280	315	350	385	420	
1 inch.....	143	167	190	238	285	333	380	428	475	523	570	

The tables given below show shipping weights and list prices on this joint. Prices shown are subject to discount, which will be quoted on application. Weights are approximate and are for uncrated shipments.

Standard lengths are 5 feet.

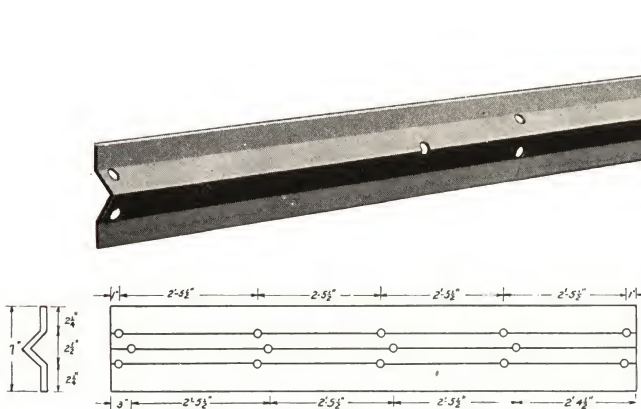
Our Duluth stock is carried in large sheets 36 inches wide and either five or ten feet long. We are equipped with power cutters so that any desired size can be furnished on short notice.

LIST PRICES—Subject to Discount

Thicknesses	Widths											
	3"	3½"	4"	5"	6"	7"	8"	9"	10"	11"	12"	
1/4 inch.....	\$ 5.50	\$ 5.90	\$ 6.40	\$ 8.30	\$ 9.60	\$11.20	\$12.70	\$14.70	\$16.30	\$17.80	\$19.20	
3/8 inch.....	8.50	9.30	7.90	10.30	12.00	14.20	15.90	18.10	20.30	22.30	23.80	
1/2 inch.....	8.40	9.30	10.00	12.90	15.10	17.80	20.00	23.00	25.70	28.00	30.80	
3/4 inch.....	11.40	12.60	13.50	17.50	20.50	24.00	27.00	31.00	34.50	38.00	41.50	
1 inch.....	15.00	16.50	18.00	23.30	27.00	32.00	36.00	41.20	46.20	50.50	55.00	

Ask for Quotations

PARTING STRIP



Our Standard parting strips are furnished in No. 16 and No. 18 gauge steel. Standard stock parting strips carried in our Duluth warehouses are 7 inches wide (after forming) and in lengths of — 10 ft. — 8 ft. — 6 ft. 3 in.

Our standard stock strips are punched to take 1/2 inch deformed round dowels spaced 30 inches center to center and also for our standard tapered wedge pins (see illustration below).

By combining our three standard stock lengths, nearly all widths of street can be taken care of with practically no waste. Other lengths up to 15 ft. can be furnished on short notice.

Write us regarding your needs.

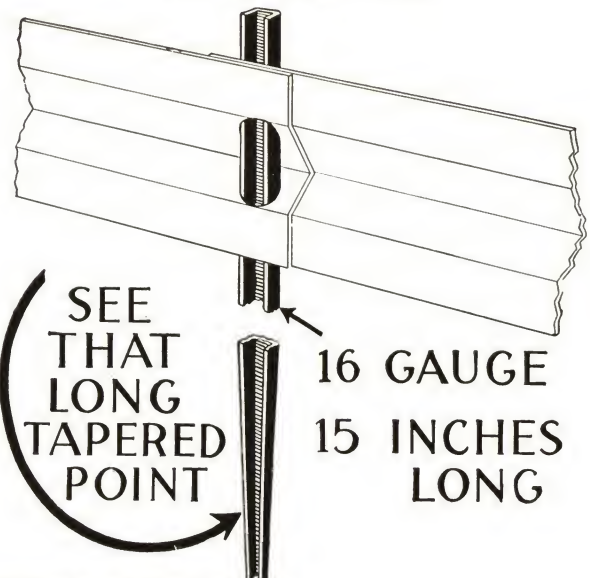
TEMPORARY ROAD STRIP CAP



We furnish 2 styles of cap—the sheet metal U shape type and the cap cut from a solid steel bar. The use of this cap is provided for in the specifications of some cities and states.

It is used as a temporary cap on the top edge of the Strip. The cap is taken off after road surface is set. The opening left is then filled with asphalt or other water-proofing as may be specified. Prices on application.

STANDARD TAPER WEDGE PINS For Parting Strip



Advantages over round rod pins:—

- 1st.—A tighter joint—a better job.
 - 2nd.—Costs no more—functions better.
 - 3rd.—More capacity for side pressure.
 - 4th.—Your man on the job likes them.
 - 5th.—More speed—money saved.
- Pins shipped in bundles of 100 each.
Approximate weight, 25 pounds per 100 pins.
Prices on application.

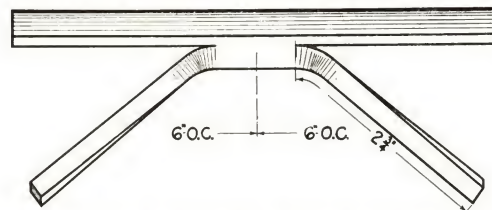
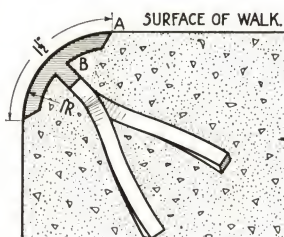
CURB BARS

We offer no apologies for recommending this as absolutely the best Curb Bar on the market. It has no metal extending into the concrete to weaken and split it.

The flared and staggered anchors not only hold firmly but act as a reinforcement.

With an incorrectly formed Curb Bar trouble is sometimes started by a heavy impact and the point marked "A" will usually be found the starting place of any trouble.

We carry in stock Round Nose Curb Bar bent to 10 foot and 20 foot radius, and are in position to furnish on 24 hours' notice bars straight and cut to any desired length or bent to any radius. Unlike many competitive bars our Curb Bars can be furnished bent to fit either internal or external curves.



HAVEMEYER ROUND NOSE CURB BAR

NOTE:—Our curb bar is rolled with a sharp edge so that no fillet is formed at this point when troweling takes place, which eliminates the chipping of the concrete. The absence of a web permits our bar to be most evenly and accurately bent without kinking.

Shipping weight about 1½ lbs. per lineal foot.



HAVEMEYER ANGLE NOSE CURB BAR

Our Angle Nose Curb Bar is rolled from 1¼"x1¼"x3/16" angle with the flared anchors sheared from the top leg. There are also three rows of staggered lugs rolled on this leg.

This type of bar is extensively used for stair nosing, to protect edges of shipping platforms, etc. Not carried in Duluth Stock. Quick shipment from our factory warehouse, straight and cut to length or bent to any desired radius.

Bates Wire Ties and Tying Tools for Reinforcing Steel

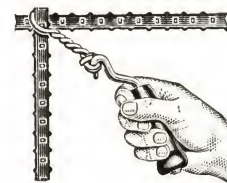


The illustration on the right shows our Bates Pistol Grip Tying tool as it appears in actual use.

This is the simplest, most inexpensive, and efficient tool ever devised for this purpose.

It does the work faster—better—cheaper.

The workmen on the job like it.



The combination of our BATES ties and tying tools will save the contractor money on any concrete job.

The labor cost for tying with the BATES ties is less than one fifth that of the old methods.

The cost of the BATES ties is less than that of plain wire when the labor of cutting the wire to length and the amount of wire wasted is taken into consideration.

Length of Ties for Various Bars

Size of Bars	Round Bars	Square, Twisted or Corrugated
¼ inch and ¼ inch ..	3 inch tie	3½ inch tie
¼ inch and ⅜ inch ..	3½ inch tie	4 inch tie
¼ inch and ½ inch ..	4 inch tie	4½ inch tie
⅜ inch and ⅜ inch ..	4 inch tie	4½ inch tie
¼ inch and ¾ inch ..	4½ inch tie	5½ inch tie
⅜ inch and ½ inch ..	4½ inch tie	5½ inch tie
⅜ inch and ¾ inch ..	4½ inch tie	5½ inch tie
½ inch and ½ inch ..	5 inch tie	6 inch tie
½ inch and ¾ inch ..	5 inch tie	6 inch tie
½ inch and 1 inch ..	5½ inch tie	6½ inch tie
¾ inch and ¾ inch ..	5½ inch tie	6½ inch tie
¾ inch and 1 inch ..	6 inch tie	7 inch tie
1 inch and ¾ inch ..	6 inch tie	7 inch tie
¾ inch and 1 inch ..	7 inch tie	8 inch tie
1 inch and 1 inch ..	7 inch tie	8 inch tie
1 inch and 1¼ inch ..	8 inch tie	10 inch tie
1¼ inch and 1¼ inch ..	10 inch tie	11 inch tie

We are also in position to furnish the old style BATES tying tool in either the long or short spiral type. The extreme simplicity of the new tool, illustrated above, has however almost supplanted the old style tool.

Ties are all made from 16 gauge wire and shipped in rolls of 5000 ties.

Sizes in which BATES Ties are furnished:

Dimension given is the extreme length over all.

x 4 "	x 6 "	8 "	11 "
x 4½ "	6½ "	8½ "	12 "
x 5 "	x 7 "	9 "	
5½ "	7½ "	10 "	

Sizes marked "x" carried in Duluth Stock. Other sizes on short notice from factory.

Prices gladly quoted on application.

WATERPROOFING MATERIALS

THE INTEGRAL METHOD OF WATERPROOFING

INTEGRAL WATERPROOFING PASTE, GF NO. 10

A smooth Paste which is dissolved in the gauging water and carried by it throughout the mass concrete or cement mortar for plaster coat work. It effectively lines and seals the pores in the mass, thus insuring absolutely watertight concrete. For use in concrete work on foundations, floors, tanks, reservoirs, tunnels, etc.

SHIPPED IN

Barrels (Approximately 400 lbs.) per pound.....	Quoted
Half Barrels (Approximately 240 lbs.) per lb.	on
5 Gal Cans (40 lbs.) per lb.	Application
Mass concrete, 8 lbs. per cu. yd.	
Plaster coat work, 8 lbs. per 100 sq ft. of 1 in. plaster.	
Labor for incorporating practically negligible.	

INTEGRAL WATERPROOFING POWDER, GF NO. 11

This product is the same material which forms when GF No. 10 paste combines with cement, in the finished concrete or mortar. GF No. 11 is mixed dry with the cement and permanently maintains its waterproofing properties, and in no way affects the set of the cement.

SHIPPED IN

50 lb. bags	Prices on Application
Mass Concrete, 12 lbs. per cu. yd.	
Labor for incorporating practically negligible.	

DAMPPOOFING FOR EXTERIOR WALLS

Dampproofing Plaster Bond, GF No. 200. — A material to be applied to interior surfaces above grade, before plastering. It forms a dampproof coating and at the same time furnishes a bond for the plaster. It is applied cold with a brush and effectively protects the interior plastered surface from the absorption of dampness and moisture.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	on
5 Gal. Cans. per gallon	Application
Covering Capacity—70 sq. ft. per gal. 1 coat	
50 sq. ft. per gal. 2 coats	
Labor, 30 gals.	
Approximate Shipping Weight—9½ lbs. per gal.	

FOUNDATION BRUSH COATING, GF No. 16.

A heavy black coating, made from strictly pure bitumen. For use on exterior foundation walls, to dampproof against ordinary moisture and soil drainage. Applied cold with a brush and forms a continuous coating over the surface and of sufficient elasticity to expand and contract without cracking or peeling.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. Per gallon	on
1 Gal. Cans. Per gallon	Application
Covering Capacity—75 sq. ft. one coat per gal.	
50 sq. ft. two coats per gal.	
Labor 25 gals.	
Approximate Shipping Weight—9½ lbs. per gal.	

MEMBRANE SYSTEM OF WATERPROOFING

for Foundations, Tanks, Swimming Pools, Bridges, Etc.

MOP COATING, GF NO. 17

A high-grade bitumen for use in connection with either GF No. 18 Felt or GF No. 21 Fabric—as a membrane waterproofing. Also used as dampproof coating. Applied hot.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices on Application
Shipping Weight—8½ lbs. pr gal.	
Covering Capacity—Mop Coat Walls and Floors, 20 sq. ft. per gal.	
Membrane—1 ply work, 11 sq. ft. per gal.	
2 ply work, 8 sq. ft. per gal.	
3 ply work, 6 sq. ft. per gal.	
Labor—Mop Coat Walls and Floors. Man and Helper, 100 gals.	
Membrane—Application included with GF 18 and GF 21.	

WATERPROOFING FELT, GF NO. 18

This product is manufactured for use with GF No. 17. It is a strong water repellent felt made up from wool stock with linen and wool fibre to give it tensile strength and thoroughly saturated with pure bitumen.

Rolls, 34 inches wide (400 sq. ft. each) per roll	Prices on Application.
Covering Capacity—1 ply work, 360 sq. ft. per roll	
2 ply work, 180 sq. ft. per roll	
3 ply work, 120 sq. ft. per roll	
Labor, Walls—Man and two helpers, 4 rolls.	
Floors or Roofs—Man and three helpers, 20 rolls.	
Approximate Shipping Weight—60 lbs. per roll.	

WATERPROOFING FABRIC, GF NO. 21

A highgrade cotton duck fabric, thoroughly saturated with strictly pure bitumen for use especially in connection with work where there is a great deal of vibration, or heavy water pressure. Rols 36 in. wide (120 sq. yds. each)—Price per sq. yd.

Covering Capacity—1 ply work, 1,000 sq. ft. per roll	Prices on Application
2 ply work, 500 sq. ft. per roll	
Labor, Walls—Man and two helpers, 1½ rolls.	
Floors or Roofs—Man and three helpers, 7 rolls.	
Approximate Shipping Weight—102 lbs. per roll.	

CEMENT FLOOR HARDENERS

CRYSTALROX FLOOR HARDENER, GF NO. 145

A chemical hardener which increases the hardness and density of a cement floor from 40 to 50%. It combines with the cement, making a hard, impervious, wear-resisting surface. Is effective on either new or old floors and renders them non-dusting and proof against weak acids, alkalies, oils, etc.

One, two or three coat work. 14 lb. cartons.

SHIPPED IN

14 pound Cartons—per lb.	Prices on Application
Covering Capacity—85 sq. ft. per lb. Two Coat work.	
Labor 28 lbs.	

Waterproofing Materials (Continued)

CEMENT FLOOR FINISH

FLOOR ENAMEL, GF NO. 155

A product containing high grade pigments combined with a tough, elastic vehicle which insures of maximum wearing surface—gives an even, uniform coating, with a high gloss.

The pigments are ground exceedingly fine and are so combined with the vehicle that when applied to cement both pigment and vehicle penetrate the pores to a depth sufficient to insure a perfect bond. Especially adapted for cement floors in hospitals, schools, hotels, libraries, and all public buildings.

Ask for special circular and color card.

COLORS FURNISHED

Gray Green Red Brown Colorless

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application

Covering Capacity—Two Coats, 200 sq. ft. per gal.
Labor, 10 gals.
Approximate Shipping Weight—9 lbs. per gal.

CEMENT ACCELERATOR, GF NO. 12

"The Contractor's Friend"

A colorless liquid which is mixed with water and used to hasten the set of cement. It also lowers the freezing point, thereby allowing of work in much colder weather than usual. Also eliminates overtime work and allows of a much better finish to concrete floors.

SHIPPED IN

Drums (Approx. 55 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	on
5 Gal. Cans. per gallon	Application

Covering Capacities of GF No. 12.

As a Frost Preventive—In Mass Concrete.
Expected Temperature 29° Fahr. $\frac{1}{2}$ gallon per sack of cement.
Expected Temperature 24° Fahr. 1 gallon per sack of cement.
Expected Temperature 17° Fahr. $1\frac{1}{2}$ gallon per sack of cement.
As an Accelerator, Hardener and Waterproofing $\frac{1}{4}$ gallon per sack of cement used.

Approximate Shipping Weight—10 pounds per gallon.

COLORED FINISH GF NO. 12

GF No. 12 is also made in a colored paste—red, brown, gray and buff. (Also Green if desired).

In this form in addition to performing all the other functions of GF No. 12, it gives a uniform, integrally colored finish that can be walked on in two days. Lined out in squares it forms an excellent yet low priced substitute for tiles for floors, porches, showrooms, hospitals and public buildings.

SHIPPED IN

Wood Barrels (Approx. 50 gals.) per gallon	Prices
Half Barrels (Approx. 30 gals.) per gallon	Quoted
5 gallon cans, per gallon	on
1 gallon cans, per gallon	Application

Covering Capacities—Factory Estimates for 100 square feet of Floor or Stucco.

Brown—1 gallon per 100 sq. ft. of surface

Buff—1 gallon per 100 sq. ft. of surface

Red—2 gallons per 100 sq. ft. of surface.

Gray—2 gallons per 100 sq. ft. of surface

Green—4 gallons per 100 sq. ft. of surface

Shipping Weights:

GF 12 Red.	22	lbs. per gallon.
GF 12 Brown,	17	lbs. per gallon.
GF 12 Buff,	17	lbs. per gallon.
GF 12 Gray,	10 $\frac{1}{2}$	lbs. per gallon.
GF 12 Green,	19 $\frac{1}{2}$	lbs. per gallon.

Labor Costs—Being added to the gauging water there is no additional labor cost when using GF No. 12.

We will gladly furnish literature completely describing the various forms in which GF No. 12 can be furnished.

SPECIAL GF No. 12 FOR LIME MORTAR

This is a special form of GF No. 12 Cement Accelerator. Ask for literature covering.

CEMENT FLOOR HARDENERS

METALLIC FLOOR HARDENER, GF NO. 140

A finely ground metallic powder which is mixed with cement and dusted over the surface prior to the final trowelling. Gives a smooth, hard dense surface that will withstand exceptionally severe traffic.

SHIPPED IN

100 pound Sacks. Price on Application

Covering Capacity—15, 20, 25, 30 lbs. per 100 sq. ft.

Labor for incorporating practically negligible.

TECHNICAL PAINTS

STONE BACKING, GF NO. 220

A high grade bitumen coating, which is applied to all unexposed sides of cut stone, marble, etc., to prevent staining and discoloration. It seals the pores of the stone, preventing the penetration of moisture and dampness from backup walls. Applied cold with brush.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application

Covering Capacity—Two coats, 75 sq. ft. per gallon.
Labor 5 gals.

Approximate Shipping Weight—9 $\frac{1}{2}$ lbs. per gal.

MASTIC CEMENT, GF NO. 250

A heavy plastic material composed of strictly pure bitumen, pine oil and reinforced with a strong asbestos fibre. For use in waterproofing concrete, tin or slate roofs, also for calking around windows and doors, pointing up flashings, chimneys, roof gutters, etc.

GF - 250 Primer should always be used before applying GF No. 250 Mastic to concrete, pulp board or other highly absorbent surfaces.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application

Walls—Covering Capacity, $\frac{1}{2}$ lb. per sq. ft. Labor, 200 lbs.

Floors and Roofs—Covering Capacity, $\frac{1}{2}$ lb. per sq. ft. Labor 1000 pounds.

GF 250 Regularly Furnished Black—Supplied in Colors on Special Orders for factory shipment only.

Approximate Shipping Weight—15 lbs. per gallon.

LIQUID PRIMER, GF NO. 250

A strictly pure bitumen coating which provides a surface on which GF No. 250 is applied on concrete, pulp board or other highly absorbant surfaces.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application

Covering Capacity—90 sq. ft. per gal.

Labor, 30 gals.

Approximate Shipping Weight—11 lbs. per gallon.

BONDING COMPOUND, GF NO. 400

To be diluted with water and used as a wash to increase the bond between old and new concrete or plaster coat.

SHIPPED IN

5 pound Jars. per pound Prices on Application.

Covering Capacity—80 sq. ft. per lb.

Labor cost practically negligible.

Waterproofing Materials (Continued)

SUPER-STRUCTURAL WATERPROOFINGS

COLORLESS WATERPROOFING, GF NO. 100

A colorless liquid for the damp-proofing of exterior walls where it is desired to retain the original color and texture of the surface. It is a brush coating—penetrating and pore-filling.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity—2 Coats, 90 sq. ft. per gallon.	
Labor, 5 gallons.	
Approximate Shipping Weight—9 lbs. per gallon.	

GF 101 BRICK & CEMENT COATING

For dampproofing and decorating brick and cement exteriors by means of a tinted brush coat.

Can furnish in either flat or gloss finish as follows:—

White — Old Ivory — Buff — Bedford Gray — Portland Gray — Concrete Gray — Tile Red — Brownstone.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity	
First Coat	125 to 150 sq. ft. per gallon
Second Coat	200 to 250 sq. ft. per gallon
Two Coats	85 to 100 sq. ft. per gallon
Approximate Shipping Weight—14½ lbs. per gallon.	

WOOD FLOOR PRESERVATIVE, GF NO. 160

Costs less; more satisfactory than hot oil. An exceptionally high grade penetrating, colorless, wood preservative which may be used on floors in Apartment Buildings, Schools, etc. Gives a smooth hard finish that is highly wear resistant, and is usually used in one coat.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity—400-600 sq. ft. per gal.	
Labor, 15 gallons.	
Approximate Shipping Weight—10½ pounds per gallon.	

GF 300 STEEL COATING

GF 300 Steel Coating is designed especially for structural steel. When brushed thoroughly over the entire surface it forms a tough, adhesive film impervious to water, acids and alkali and insulates the steel from electricity.

Made in five colors as follows: Black, Gray, Green, Red and Brown.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity	
First Coat	200 sq. ft. per gallon
Second Coat	200 sq. ft. per gallon
Two Coats	100 sq. ft. per gallon
Approximate Shipping Weight—11¼ lbs. per gallon.	

GF 325 PROTECTIVE COATING

GF 325 is manufactured as a final protective coating to be used over a shop coat such as GF 300. Its constituent parts are fused together at great heat to prevent disintegration by the lime in cement or cement grout and keep the coating permanently elastic.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity	
First Coat	200 sq. ft. per gallon
Second Coat	200 sq. ft. per gallon
Two Coats	Approximately 100 sq. ft. per gallon
Approximate Shipping Weight—9½ lbs. per gallon.	

GF 350 GALVANIZED IRON COATING

GF 350 is used for painting galvanized iron, tin or zinc materials, such as gutters and leaders, roofing and siding, etc.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity	
First Coat	275 sq. ft. per gallon
Second Coat	325 sq. ft. per gallon
Two Coats	150 sq. ft. per gallon
Labor Cost	
One man can apply 5 gallons per day.	
Approximate Shipping Weight—10 lbs. per gallon.	

GF 550 TIMBER PRESERVATIVE

GF Timber Preservative (GF 550) is a combination of creosote, zinc, salt and copper, that penetrates the pores, and combining with the sap enables the latter to resist the attacks of dampness, oils, insects, fungi and other causes that would rapidly destroy it.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity	
100 sq. ft. of rough surfaces per gallon.	
200 sq. ft. of smooth surfaces per gallon.	
Approximate Shipping Weight—10 lbs. per gallon.	

GF 99 ACID PROOFING

GF Acidproofing (GF 99) is a colorless coating, which when applied to a cement, brick, plaster, wood or metal surface, closes it completely against the action of organic or dilute acids, smoke or alkali solutions or gases.

After applying GF Acidproofing, it is necessary for the surface to cure or dry for 4 days before using.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity	
First Coat	350 sq. ft. per gallon
Two Coats	Approximately 200 sq. ft. per gallon
Approximate Shipping Weight—9¼ lbs. per gallon.	

NOTICE

Extra charge for steel drums with the exception of those for No. 17 and No. 250 (30 gallon - \$5.00, 50 gallon - \$6.50) rebated if returned in good condition and freight prepaid.

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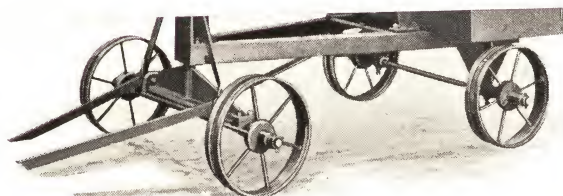
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(see cut below.)



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COLORLESS

A colorless liquid where it is desired to re surface. It is a brush c

Drums (Approx. 50 gals.
Half Drums (Approx. 30
5 Gal. Cans. per gallon
1 Gal. Cans. per gallon
Covering Capacity—2 Co
Labor, 5 gallons.
Approximate Shipping W

GF 101 BF

For dampproofing
by means of a tinted bri
Can furnish in eith
White — Old Ivory
Gray — Concrete Gray -

Drums (Approx. 50 gals.
Half Drums (Approx. 30
5 Gal. Cans. per gallon
1 Gal. Cans. per gallon
Covering Capacity
First Coat
Second Coat
Two Coats
Approximate Shipping W

WOOD FLOOR

Costs less; more se
high grade penetrating, c
used on floors in Apart
smooth hard finish that
used in one coat.

Drums (Approx. 50 gals.)
Half Drums (Approx. 30
5 Gal. Cans. per gallon
1 Gal. Cans. per gallon ..
Covering Capacity—400-6
Labor, 15 gallons.
Approximate Shipping We

GF 3

GF 300 Steel Coat
steel. When brushed tho
tough, adhesive film imp
insulates the steel from el

Made in five colors as follows: Black, Gray, Green, Red and Brown.

SHIPPED IN

Drums (Approx. 50 gals.) per gallon	Prices
Half Drums (Approx. 30 gals.) per gallon	Quoted
5 Gal. Cans. per gallon	on
1 Gal. Cans. per gallon	Application
Covering Capacity	
First Coat	200 sq. ft. per gallon
Second Coat	200 sq. ft. per gallon
Two Coats	100 sq. ft. per gallon
Approximate Shipping Weight—11¾ lbs. per gallon.	

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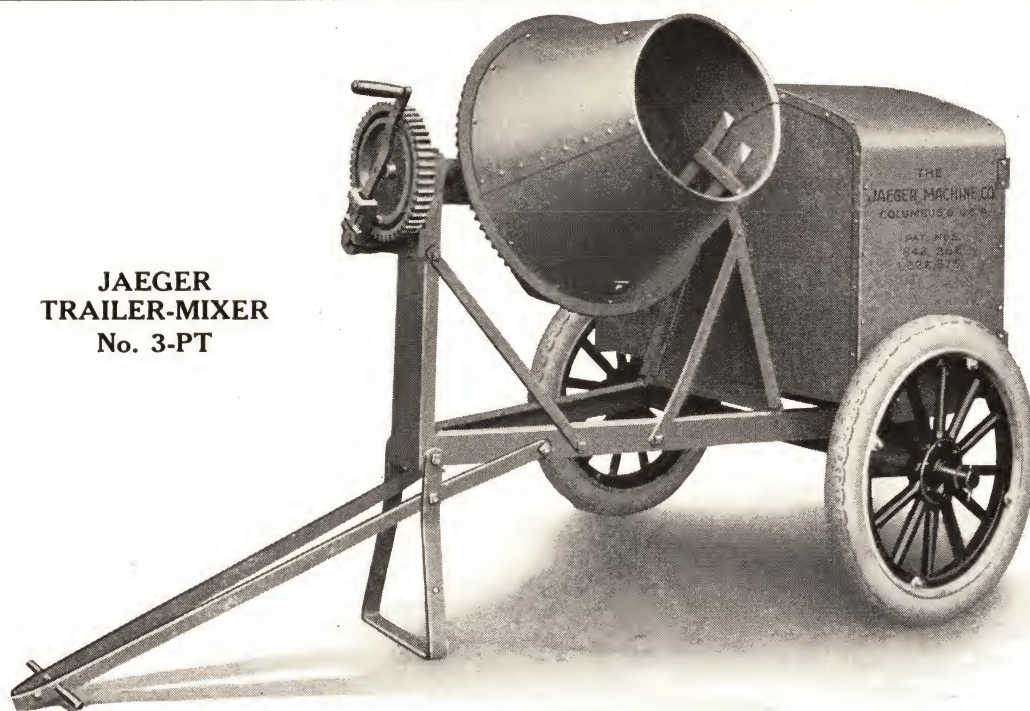
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ted

1 Gal. Cans. per gallon	Application
Covering Capacity	
First Coat	350 sq. ft. per gallon
Two Coats	Approximately 200 sq. ft. per gallon
Approximate Shipping Weight—9¾ lbs. per gallon.	

NOTICE

Extra charge for steel drums with the exception of those for No. 17 and No. 250 (30 gallon - \$5.00, 50 gallon - \$6.50) rebated if returned in good condition and freight prepaid.

**JAEGER
TRAILER-MIXER
No. 3-PT**



THE No. 3 SIZE JAEGER MIXERS

Capacity—3 to 4 cu. ft. per batch unmixed materials. Weight, 1,000 pounds.

Three kinds of wheels for Trailers.

No. 3-PT—Furnished with regular 30x3½ pneumatic tires, as illustrated above.

No. 3-CT—Furnished with regular 30x3½ solid cushion tires.

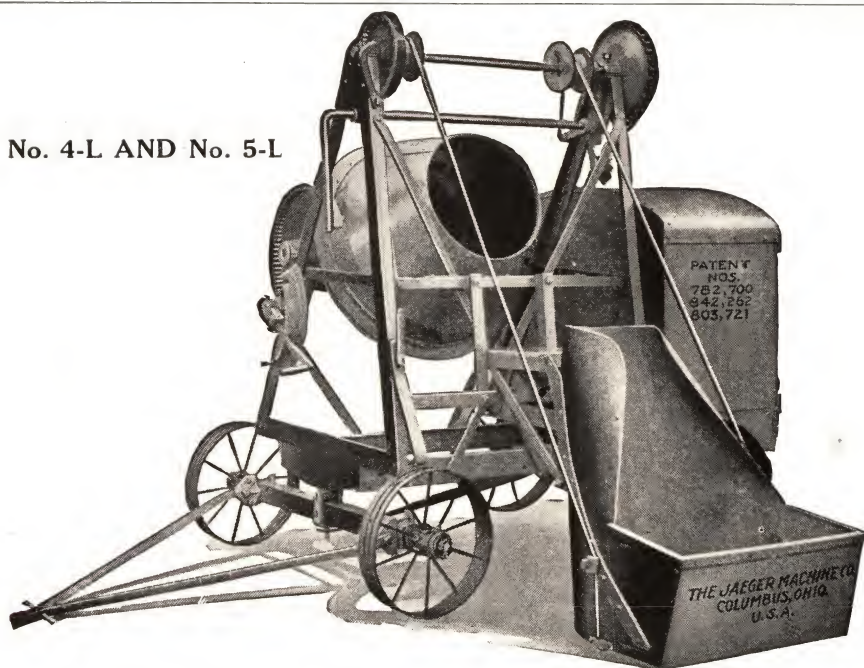
No. 3-ST—Furnished with regular Steel Wheels, 30-inch diameter.

Also furnished mounted on four regular steel wheels 18 inches diameter. (See cut below.)

No. 3-E



No. 4-L AND No. 5-L



Capacity, No. 4L and No. 4H—Fully 4 cu. ft. per batch mixed concrete, and will accommodate 7 cu. ft. unmixed materials, using 1 cu. ft. cement, 2 cu. ft. sand and 4 cu. ft. of stone.

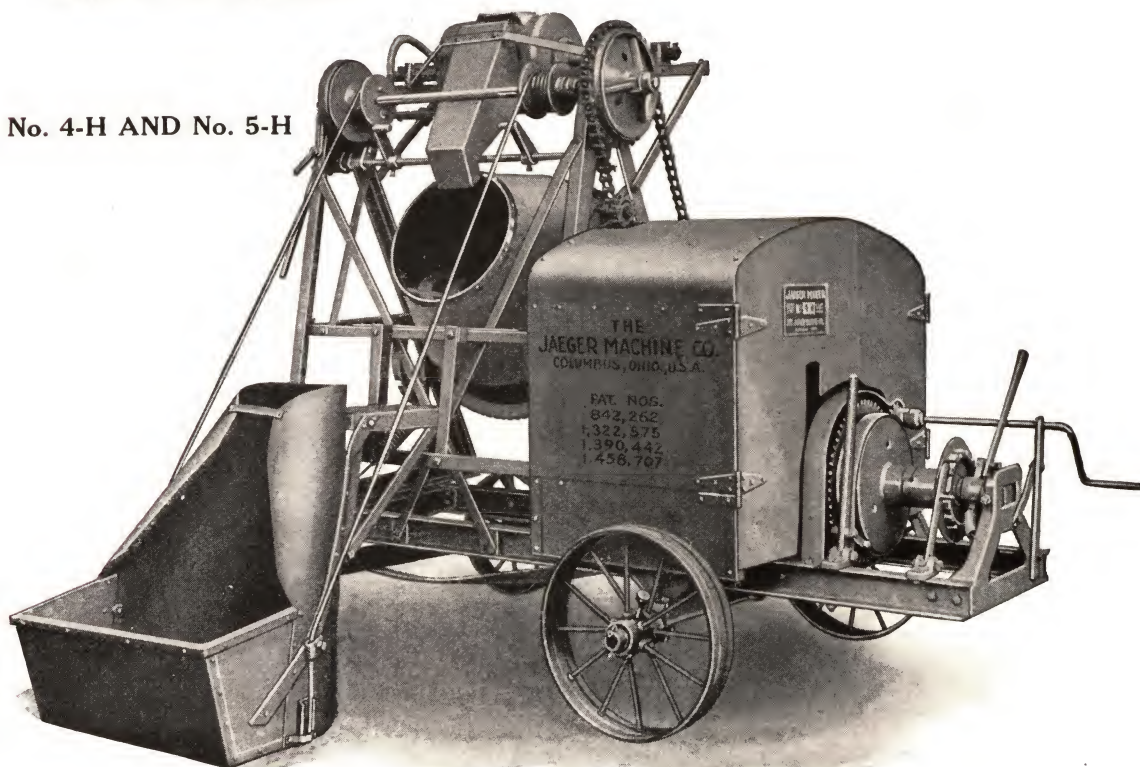
The weight—No. 4L, 2,500 pounds; No. 4H, 3,400 pounds.

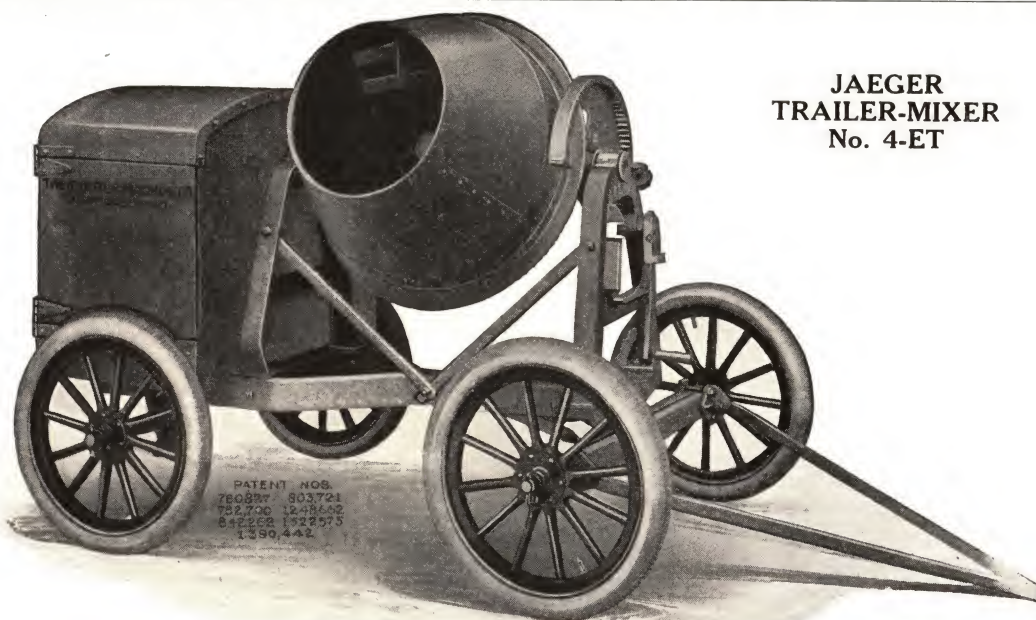
Capacity, No. 5L and No. 5H—Fully 5 cu. ft. per batch mixed concrete and will accommodate 9 cu. ft. unmixed material, using 1 cu. ft. cement, 3 cu. ft. sand, and 5 cu. ft. of stone.

Weight, No. 5L, 3,000 pounds.

Weight, No. 5H, 3,800 pounds.

No. 4-H AND No. 5-H





**JAEGER
TRAILER-MIXER
No. 4-ET**

No. 4-E AND No. 4-ET JAEGER MIXERS

Capacity—Fully 4 cu. ft. per batch of mixed concrete. A dependable Mixer for plaster of any kind. Mounted on four steel wheels, 18 inches diameter, or four regular pneumatic tired wheels, or four solid rubber cushion tires.

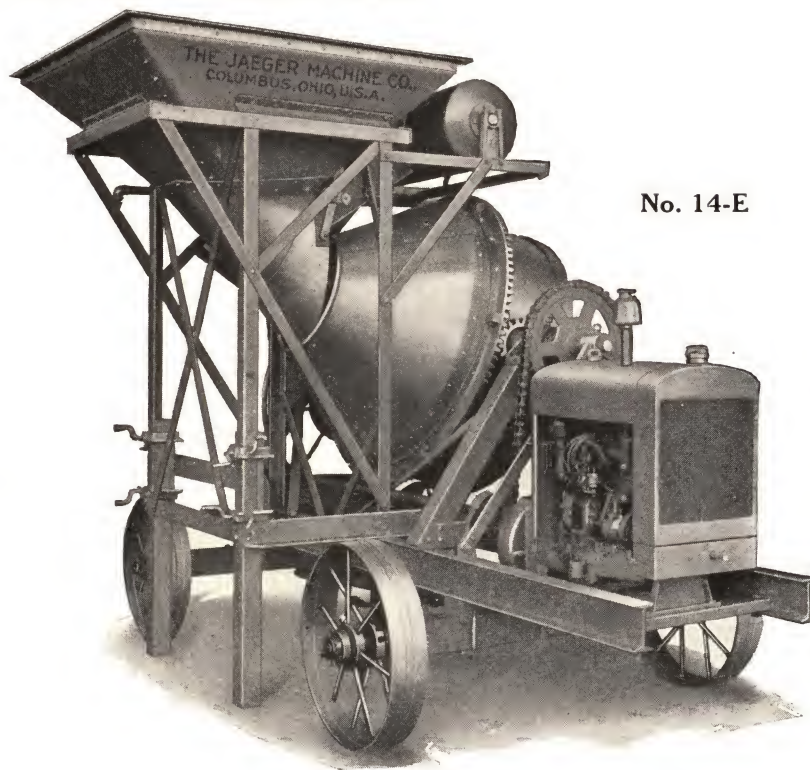
Weight—1,800 pounds.

No. 14E Jaeger Mixer with Batch Hopper and 4-Cylinder Engine and Watertank.

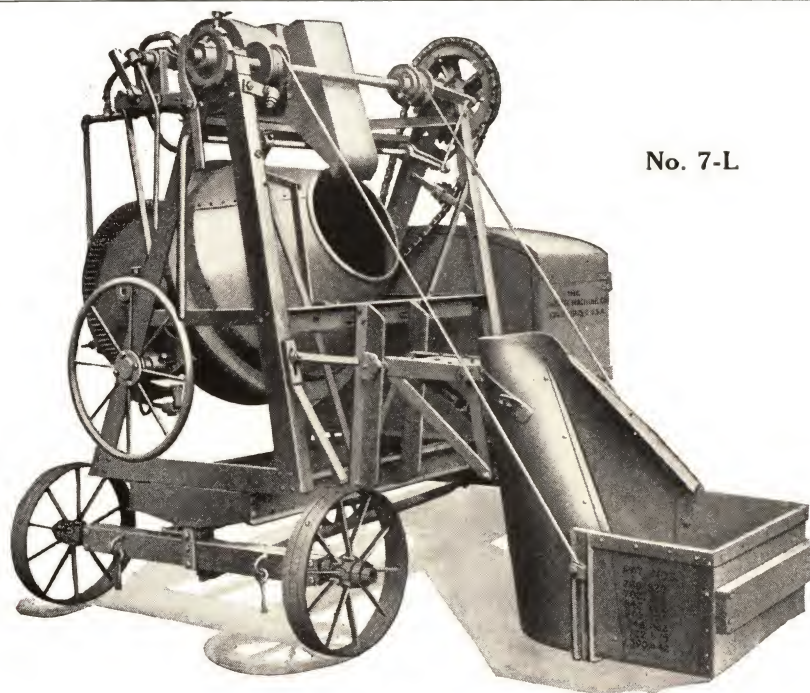
Capacity—14 cu. ft. mixed concrete.

Weight—5,000 pounds.

Can be furnished less Batch Hopper or Engine.



No. 14-E

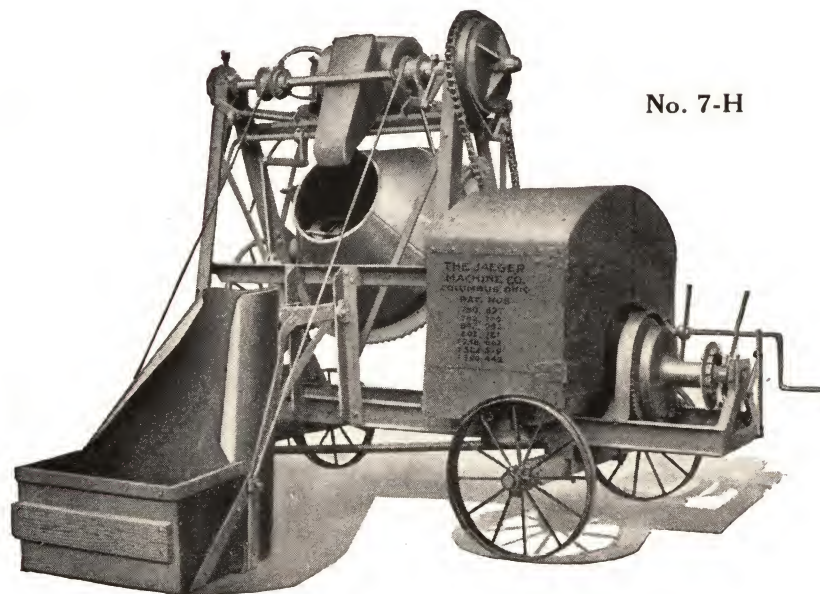


No. 7-L

Capacity—Fully 7 cu. ft. per batch mixed concrete, and will accommodate 14 cu. ft. unmixed materials.

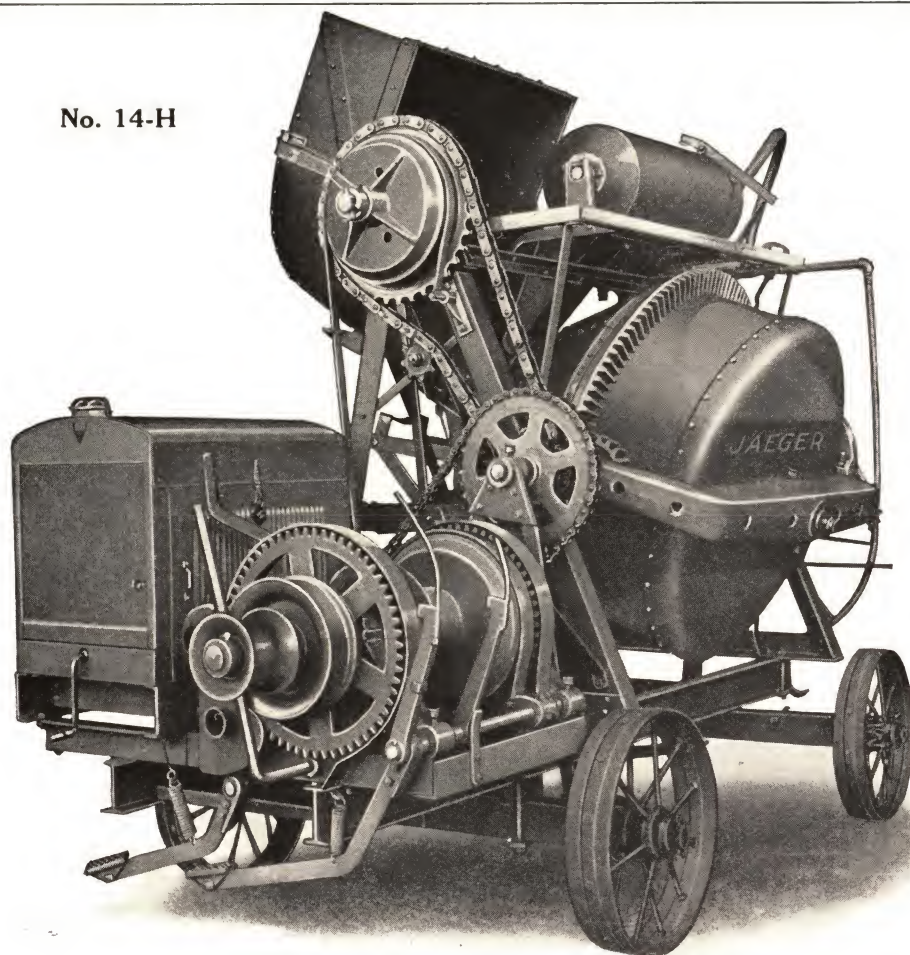
Weight No. 7L, 4,700 pounds. Weight No. 7H, 5,500 pounds.

Can be furnished with 4-Cylinder Engine and reversible Sheave Hoist if desired.



No. 7-H

No. 14-H



No. 14-L

Capacity—Fully 14 cu. ft. per batch mixed concrete, and will accommodate 21 cu. ft. unmixed materials, using 3 cu. ft. cement, 6 cu. ft. sand and 12 cu. ft. of stone. The weight, No. 14L, 6,645 pounds. Weight No. 14H, 8,150 pounds.

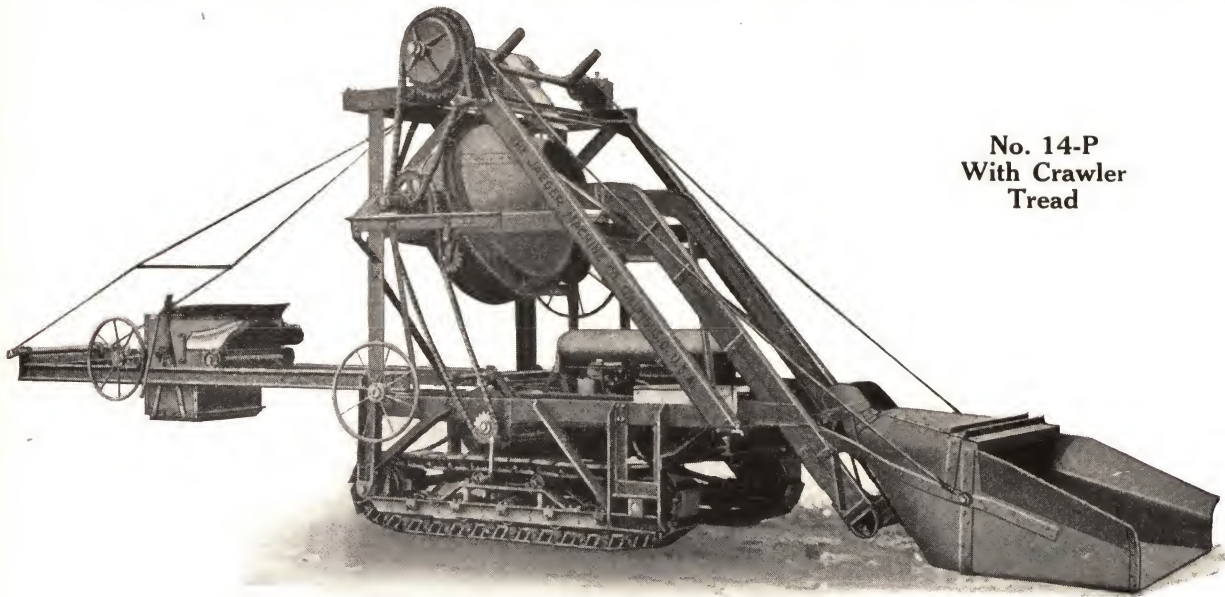
Engine on No. 14L, 10 to 15 H. P., 4-cylinder.

Engine on No. 14H, 30 to 35 H. P., 4-cylinder.

Hoist, free running one way, and with nigger-head and reversible Sheave.

Also built without Hoist, or on Skids only, without or with engine; with or without Batch Hopper.





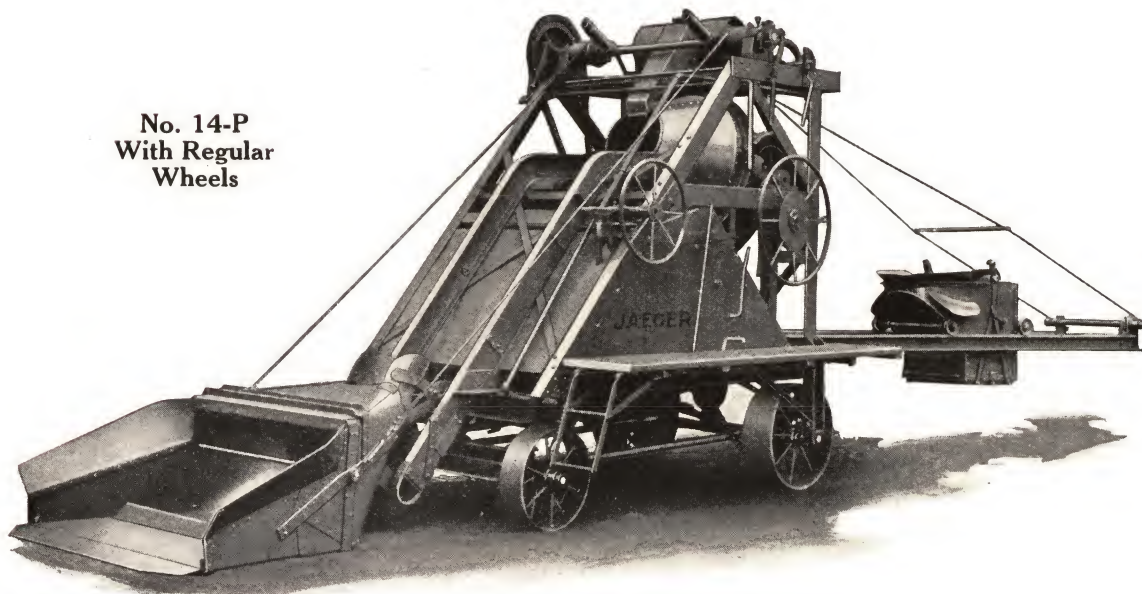
**No. 14-P
With Crawler
Tread**

NOTE:—Cover for engine removed so as to show complete Fordson as power unit.

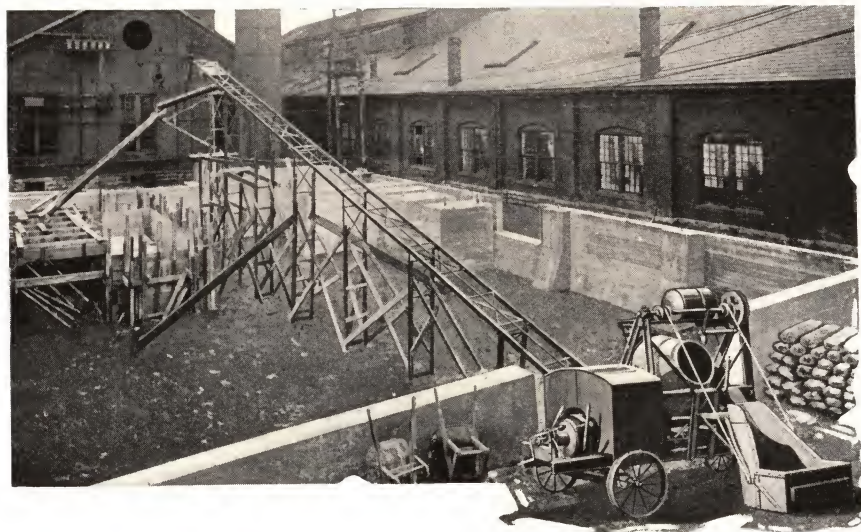
THE JAEGER PAVER IS NOW BUILT IN TWO SIZES

No. 7P—Capacity, 7 cu. ft. mixed concrete. Boom and bucket or regular spout. Regular wheels. Weight, 7,500 pounds.

No. 14P—Capacity, 14 cu. ft. mixed concrete. Boom and bucket or regular spout. Regular wheels or crawler Traction. Weight, 14,400 pounds.



**No. 14-P
With Regular
Wheels**



THE JAEGER PLACING PLANT

A Mixer and Placing Plant combined to mix and place concrete. Built in four sizes.

	No. 4	No. 5	No. 7	No. 14
Capacity cu. ft. mixed concrete.....	4	5	7	14
Weight	6100	7200	8300	12000



When the "Seat" of A Road Wears Out



*A Central Mixing Plant,
Franklin County, Ohio.
Materials are mixed and hauled to the
place to be used by motor truck.*

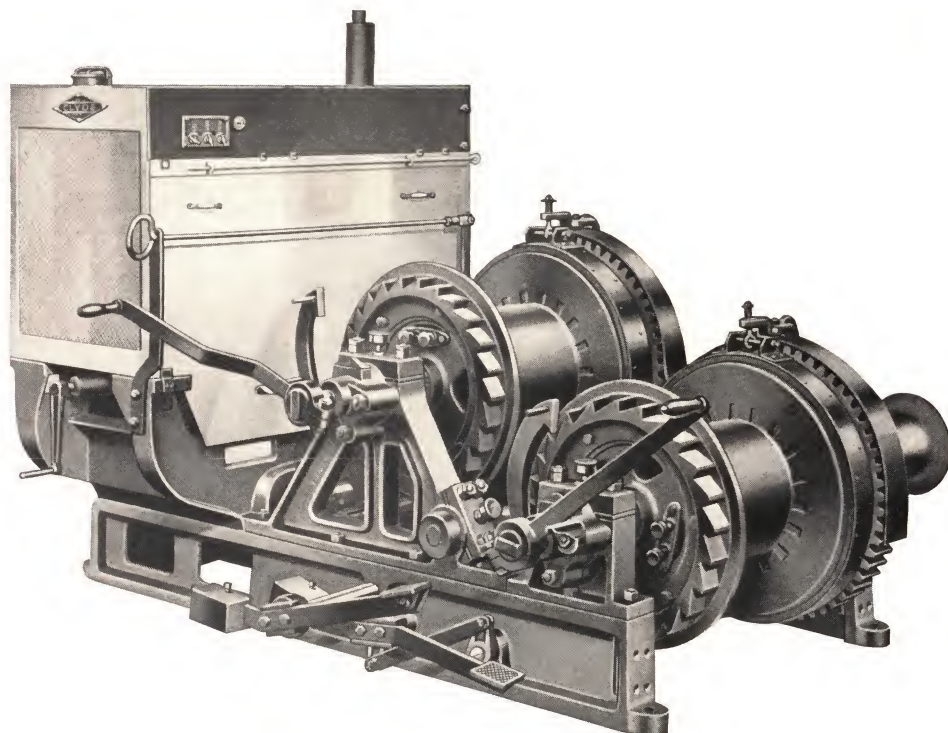


*Another Central Mixing
Plant by a State High-
way Dept.*

Jaeger Mixers are especially adapted to the mixing of bituminous concrete (tar and stone), for the purpose of patching or resurfacing streets and roads.



*State of New
York Mixing
Right Out On
the Road.*

Gasoline Hoist, Two Drum**Silent Chain Drive****Manufactured by Clyde Iron Works, Duluth, Minnesota.**

THE above illustrates our 20, 30, 40 and 50 Horse Power two-drum gasoline hoist with silent chain drive. These hoists are a complete self-contained unit with all accessories ready to run.

Semi-Steel Gears, Cut Teeth								
Catalog Number	HOISTING DUTY		GASOLINE MOTOR		DRUMS		Size of Bed Inches	Approximate Shipping Weight Pounds
	Load Pounds	Feet Per Minute	Horse Power	Number of Cylinders	Diameter Inches	Length Between Flanges Inches		
6507	1000	165	8	2	6	10	24x58	1600
6508	1500	110	8	2	6	10	24x58	1600
6510	2000	150	15	4	7	11	30x66	2200
6511	2500	110	15	4	12	16	36x73	4200
6512	3000	155	20	4	12	16	36x73	4500
6513	4500	160	30	4	14	17	44x87	7100
6514	5500	170	40	4	14	22	51x89	8800
Steel Gears, Cut Teeth								
6515	7000	170	50	4	14	22	51x89	9000

All 20 h. p. and larger hoists are equipped with free engine clutch.

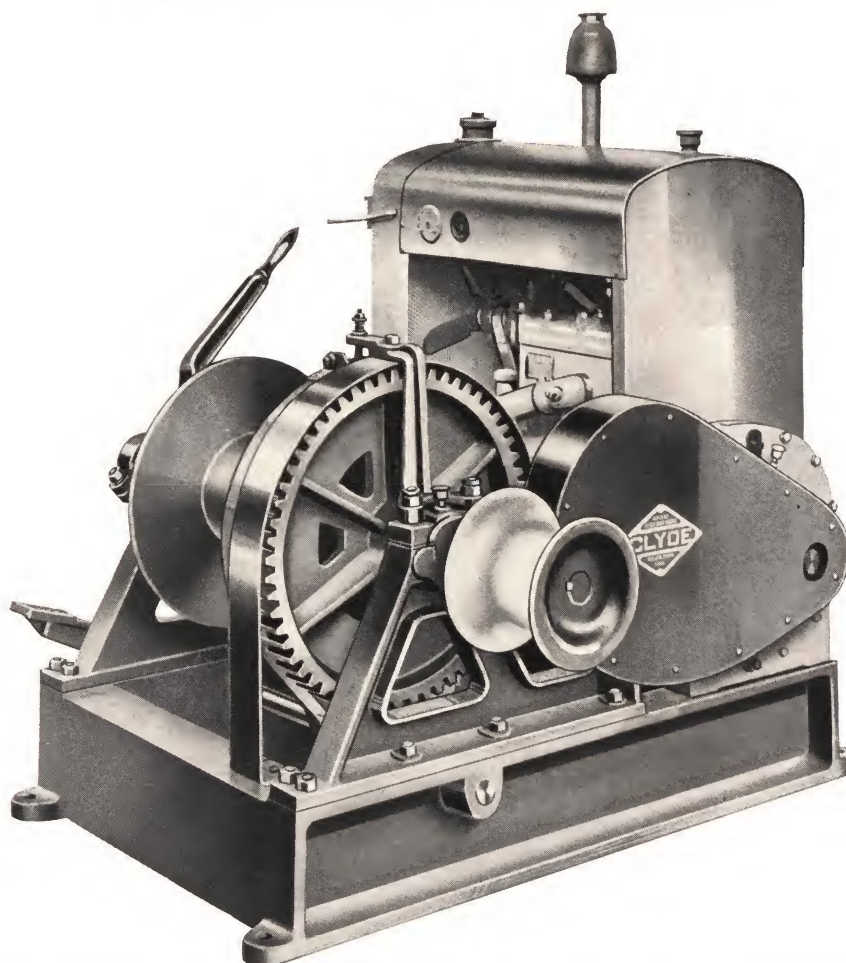
All gasoline motors are direct connected to the hoist with silent chain drive and are complete with fuel tank, radiator and fan and all accessories, ready to run.

All two-drum hoists have winchhead on the front drum shaft only.

Gasoline Hoist, Single Drum

Silent Chain Drive

Manufactured by Clyde Iron Works, Duluth, Minnesota.



THE hoist shown above is our 8 and 15 Horse Power single friction drum gasoline hoist with silent chain drive. The hoisting drums and gasoline motor with all accessories are mounted on a substantial cast bed plate, and each hoist is a complete self-contained unit.

Semi-Steel Gears, Cut Teeth

Catalog Number	HOISTING DUTY		GASOLINE MOTOR		DRUMS		Size of Bed Inches	Approximate Shipping Weight Pounds
	Load Pounds	Feet Per Minute	Horse Power	Number of Cylinders	Diameter Inches	Length Between Flanges Inches		
6497	1000	165	8	2	6	10	24x44	1300
6498	1500	110	8	2	6	10	24x44	1300
6500	2000	150	15	4	7	11	30x52	1800
6501	2500	110	15	4	12	16	36x60	3100
6502	3000	155	20	4	12	16	36x60	3300
6503	4500	160	30	4	14	17	44x71	5200
6504	5500	170	40	4	14	22	51x74	6800

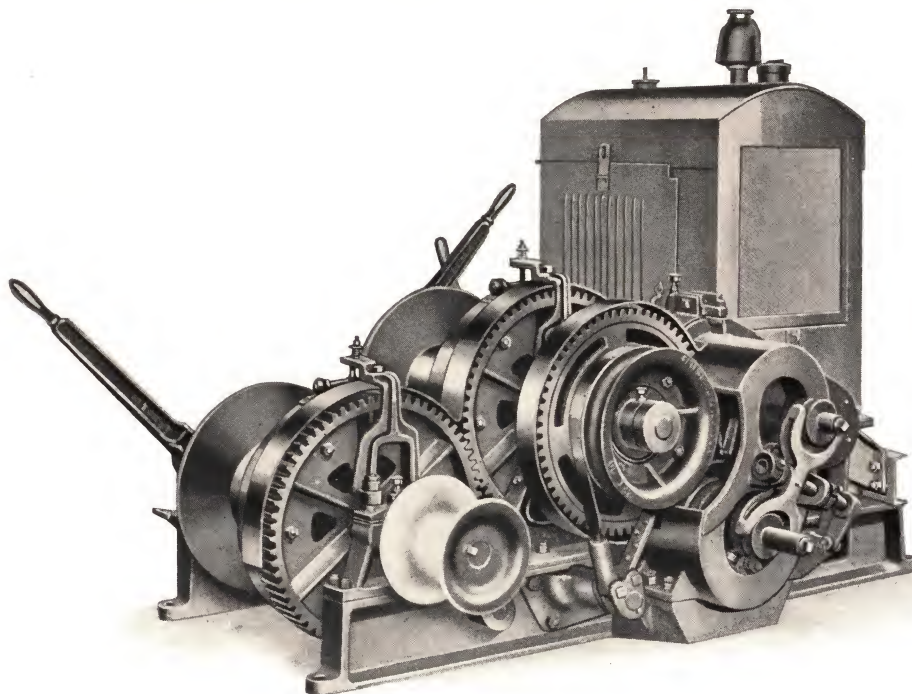
Steel Gears, Cut Teeth

6505	7000	170	50	4	14	22	51x74	7000
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All 20 h. p. and larger hoists are equipped with free engine clutch.

All gasoline motors are direct connected to the hoist with silent chain drive and are complete with fuel tank, radiator and fan and all accessories, ready to run.

All one drum hoists have winchhead on the drum shaft.

Gasoline Builders' Hoist**Two Drum, with Reversing Elevator Sheave****Silent Chain Drive****Manufactured by Clyde Iron Works, Duluth, Minnesota.**

THE hoist illustrated above has been especially designed for the handling of material elevators, either single or double cage. A shifting lever within easy reach of the operator, controls the band friction clutches on the reversing mechanism, and permits the independent use of the hoisting drum.

Band brakes are provided for the drums and a latched band brake for the elevator sheave, enabling the operator to lock it at any point.

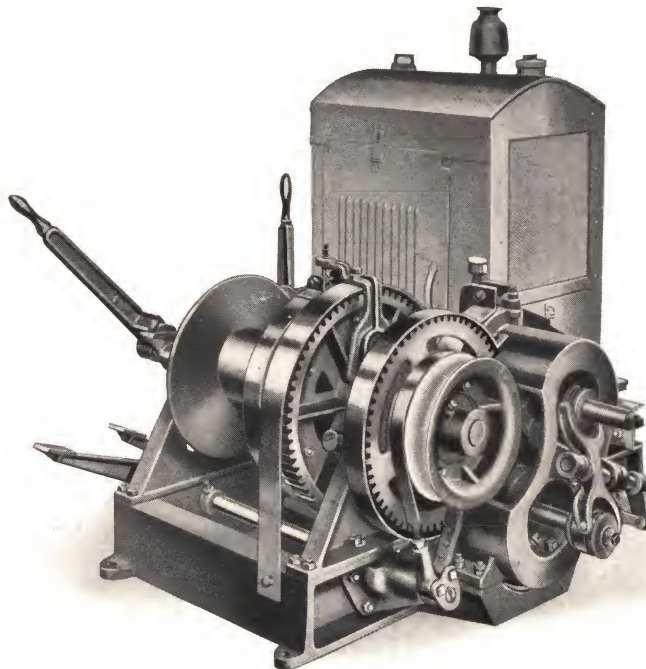
Semi-Steel Gears, Cut Teeth

Catalog Number	HOISTING DUTY		GASOLINE MOTOR		DRUM		SHEAVE			Size of Bed Inches	Aprox. Shipping Weight Lbs.
	Load Lbs.	Feet Per Min.	Horse Power	No. of Cylinders	Diam. Inches	Length Between Flanges Inches	Load Lbs.	Feet per Min.	Diam. Inches		
6586	1000	165	8	2	6	9	500	360	11	24x58	2100
6587	1500	110	8	2	6	9	650	250	11	24x58	2100
6588	2000	150	15	4	7	11	800	350	14	30x66	3100
6590	2000	150	15	4	7	11	1400	200	14	30x66	3100
6591	2500	110	15	4	12	16	1400	200	18	36x73	4800
6592	3000	155	20	4	12	16	1400	280	18	36x73	5000
6593	4500	160	30	4	14	17	2500	250	21	44x87	8800

All 20 h. p. and larger hoists are equipped with free engine clutch.

All gasoline motors are direct connected to the hoist with silent chain drive and are complete with fuel tank, radiator and fan and all accessories, ready to run.

All two-drum hoists have winchhead on the front drum shaft only.

Gasoline Builders' Hoist**Single Drum, with Reversing Elevator Sheave****Silent Chain Drive****Manufactured by Clyde Iron Works, Duluth, Minnesota.**

THE hoist illustrated above has been especially designed for the handling of material elevators, either single or double cage. A shifting lever within easy reach of the operator, controls the band friction clutches on the reversing mechanism, and permits the independent use of the hoisting drum.

A band brake is provided for the drum, and a latched band brake for the elevator sheave, enabling the operator to lock it at any point.

Semi-Steel Gears, Cut Teeth

Catalog Number	HOISTING DUTY		GASOLINE MOTOR		DRUM		SHEAVE			Size of Bed Inches	Aprox. Shipping Weight Lbs.
	Load Lbs.	Feet per Min.	Horse Power	No. of Cylinders	Diam. Inches	Length Between Flanges Inches	Load Lbs.	Feet per Min.	Diam. Inches		
6576	1000	165	8	2	6	9	500	360	11	24x44	1600
6577	1500	110	8	2	6	9	650	250	11	24x44	1600
6578	2000	150	15	4	7	11	800	350	14	30x52	2300
6580	2000	150	15	4	7	11	1400	200	14	30x52	2300
6581	2500	110	15	4	12	16	1400	200	18	36x60	3900
6582	3000	155	20	4	12	16	1400	280	18	36x60	4100
6583	4500	160	30	4	14	17	2500	250	21	44x71	6800

All 20 h. p. and larger hoists are equipped with free engine clutch.

All gasoline motors are direct connected to the hoist with silent chain drive and are complete with fuel tank, radiator and fan and all accessories, ready to run.

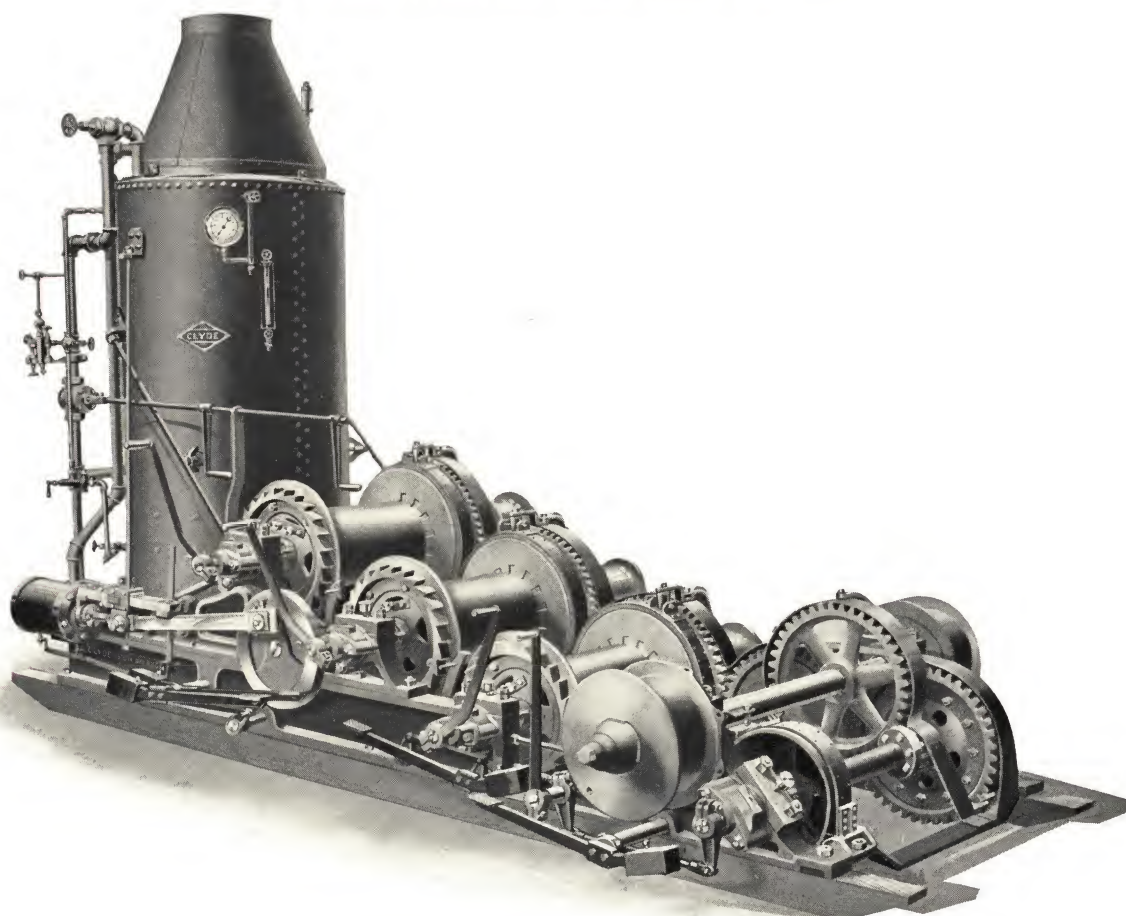
All one-drum builders' hoists are without winchhead.

Hoisting Engine, Three Drum, Double Cylinder

With Boiler

And Derrick Swinging Gear for Operating Clam Shell and Orange Peel Buckets.

Manufactured by Clyde Iron Works, Duluth, Minn.



Semi-Steel Gears, Cut Teeth

Catalog Number	Size Cylinders Inches Bore Stroke	Horse Power	Size Bed Including Swinger Inches	Hoisting Drums		Load Capacity on Single Line at Normal Speed Pounds	BOILER			Swinging Drums		No. of Revolutions of Hoisting Drums to One of Swinging Drums	Aprox. Shipping Weight Pounds	Catalog No. of Swinging Gear
				Diam. Inches	Length Between Flanges Inches		Diam. Inches	Length Inches	No. 2-inch Flues	Diam. Inches	Length Between Flanges Inches			
450	5½ x 8	16	49x182	12	22	4000	36	72	76	14	10	4	13100	366
451	6¼ x 8	20	49x182	14	22	4500	36	72	76	14	10	4	13400	366
452	6¼ x 10	25	56x190	14	27	5500	42	90	96	14	10	4	15600	367
453	7 x 10	30	56x190	14	27	7000	42	90	96	14	10	4	15900	367

Steel Gears, Cut Teeth

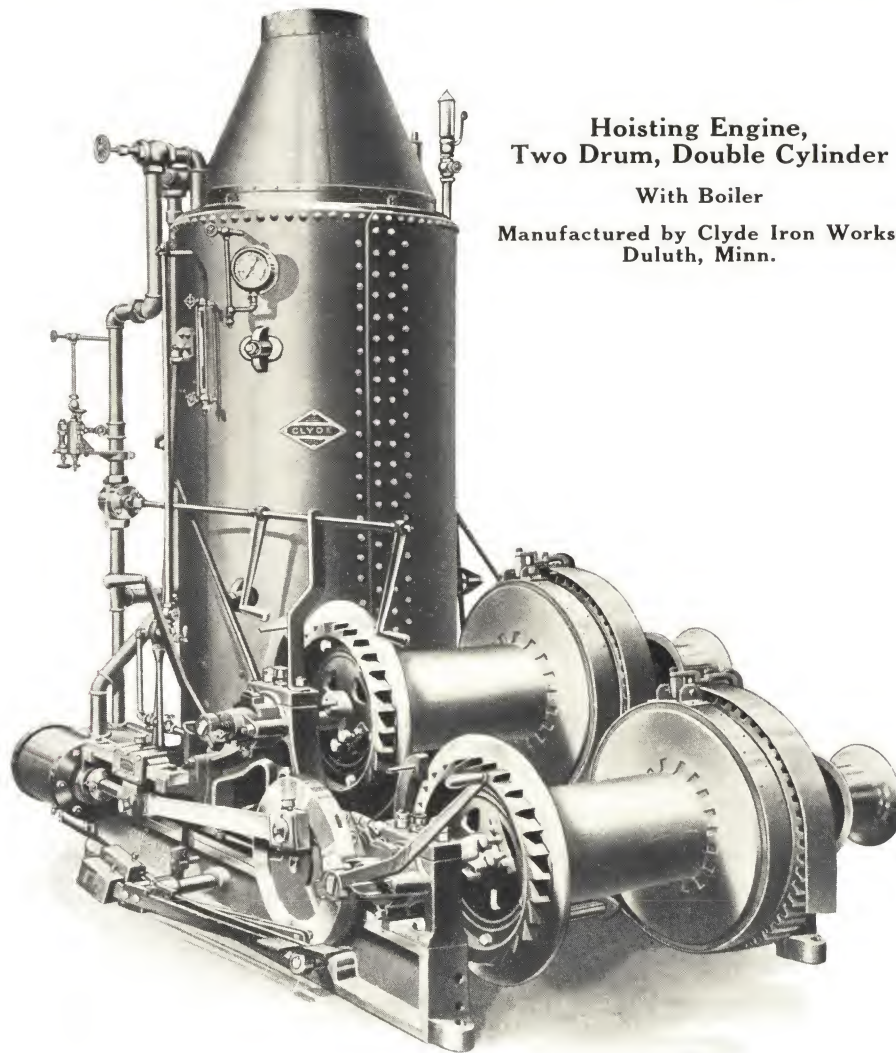
454	7 x 10	30	56x190	14	27	7000	42	90	96	14	10	4	15900	368
455	8¼ x 10	40	60x204	14	28	9000	42	102	96	14	12	4	19300	369
456	8¼ x 10	40	72x212	14	39	9000	48	102	128	14	12	4	22300	370
457	9 x 10	50	60x204	14	28	10000	42	114	96	14	12	4	19800	369
458	9 x 10	50	72x212	14	39	10000	48	114	128	14	12	4	22800	370
459	10 x 10	60	70x246	18	39	11000	54	102	180	18	12	4½	27700	371
460	10 x 12	70	70x248	18	39	13000	54	108	180	18	12	4½	29700	371
461	11 x 13	85	72x262	18	38	16000	60	120	216	18	12	4½	39500	372
462	12 x 14	100	72x282	18	37	20000	66	120	308	18	12	4½	47700	373

11x13 and 12x14 hoists are built with outside valve motion. All hoists are furnished complete as shown, with foot brakes.

Swinger is complete with hand friction lever and latched brake lever.

Forward and middle drum shaft extensions are fitted with fixed winch heads.

Rear drum gear is bronze bushed and runs free on the shaft.



**Hoisting Engine,
Two Drum, Double Cylinder**

With Boiler

**Manufactured by Clyde Iron Works,
Duluth, Minn.**

Semi-Steel Gears, Cut Teeth

Catalog Number	Size Cylinders Inches Bore Stroke	Horse Power	Size of Bed Inches	DRUMS		Load Capacity on Single Line at Normal Speed Pounds	Weight Pile Driver Hammer For Rapid Work Pounds	BOILER			Aprox. Shipping Weight Pounds
				Diam. Inches	Length Between Flanges Inches			Diam. Inches	Length Inches	No. 2-Inch Flues	
101	4½ x 6	12	40x 75	8	18	3000	1200	30	72	52	5000
102	5½ x 8	16	49x 85	12	22	4000	2000	36	72	76	7700
103	6½ x 8	20	49x 85	14	22	4500	2200	36	72	76	7900
104	6½ x 10	25	56x 92	14	27	5500	2800	42	90	96	10700
105	7 x 10	30	56x 92	14	27	7000	3200	42	90	96	11100

Steel Gears, Cut Teeth

106	7 x 10	30	65x 92	14	27	7000	3200	42	90	96	11100
107	8½ x 10	40	60x 97	14	28	9000	4000	42	102	96	13400
108	8½ x 10	40	72x 105	14	39	9000	4000	48	102	128	15200
109	9 x 10	50	60x 97	14	28	10000	4500	42	114	96	13900
110	9 x 10	50	72x 105	14	39	10000	4500	48	114	128	15700
111	10 x 10	60	70x 120	18	39	11000	5000	54	102	180	19700
112	10 x 12	70	70x 120	18	39	13000	5500	54	108	180	21500
113	11 x 13	85	72x 146	18	38	16000	.....	60	120	216	28500
114	12 x 14	100	72x 162	18	37	20000	.....	66	120	308	34000

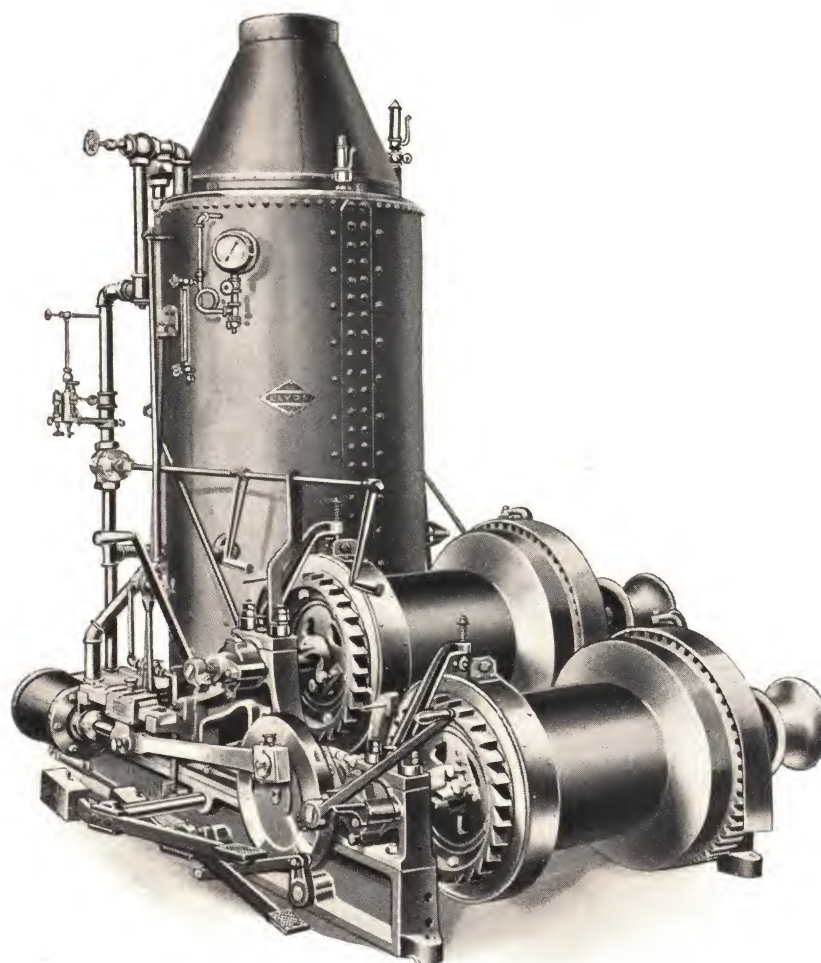
11x13 and 12x14 hoists are built with outside valve motion.

All hoists are furnished complete as shown, with foot brake and fixed winch head on end of each drum shaft.

Concrete Tower Hoist, Two Drum

With Boiler

Manufactured by Clyde Iron Works, Duluth, Minnesota.



Steel Gears, Cut Teeth

Catalog Number	Size Cylinders Inches Bore and Stroke	H. P.	Size of Bed Inches	DRUM		Load Capacity Single Line at Normal Speed	Normal Hoisting Speed Feet per Minute	Size Concrete Bucket Adapted for Cubic Yards	BOILER			Approx. Shipping Weight Pounds
				Diam. Inches	Length Between Flanges Inches				Diam. Inches	Length Inches	Number 2-Inch Flues	
1015	7x10	30	56x 92	18	24	3500	280	$\frac{1}{2}$	42	90	96	11500
1016	8 $\frac{1}{4}$ x10	40	72x105	18	36	4500	290	$\frac{3}{4}$	48	102	128	15600
1017	9x10	50	72x105	18	36	5500	300	1	48	114	128	16100
1018	10x12	70	70x120	26	35	8000	290	1 $\frac{1}{2}$	54	108	180	22100
1019	10x12	70	70x120	21	35	10000	230	2	54	108	180	22100

Drums are equipped with asbestos lined brake bands on opposite end from friction.

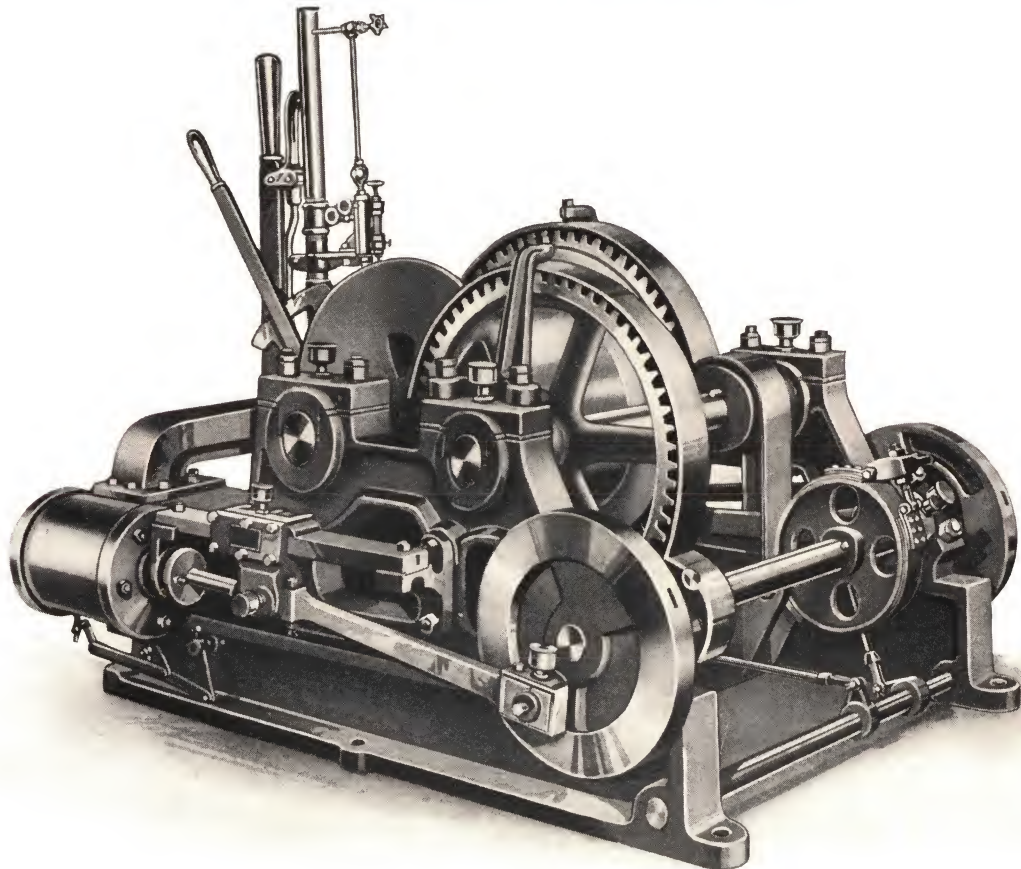
Winch heads are furnished on ends of drum shafts.

Drums of larger diameter for handling lighter loads at correspondingly higher speeds can be furnished if desired.

Swinging Engine, Double Cylinder, Compound Geared

[Furnished With Either Reversing Valve or Link Motion]
Specially Adapted for Heavy Barge Derricks or Dredges.

Manufactured by Clyde Iron Works, Duluth, Minnesota.



THIS engine is specially designed for swinging booms on heavy barge derricks, dredges, or in any class of heavy derrick work. We can furnish this engine in either the reversing valve type (as shown in illustration) or link motion for moderate work, and in the link motion only for heavy duty. It is designed with extra heavy shafting and long bearings to withstand severe strains encountered in dredge work. The gearing is compounded to reduce speed and increase the pulling capacity. A brake is furnished, operated by a latched hand lever, by means of which the operator can control the boom in swinging.

The entire engine is simple and compact in design and is built especially strong for severe duty.

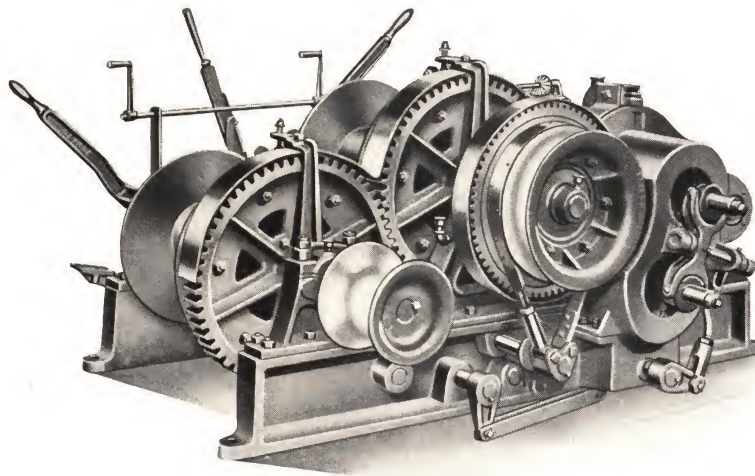
With Reversing Valve

Catalog Number	Size Cylinders Inches Bore Stroke	Horse Power	Size of Bed Inches	Maximum Width of Engine Over All Inches	Swinging Drums		Maximum Pulling Capacity Pounds	Ratio of Gearing	Material in Gears	Approx. Shipping Weight Pounds
					Diam. Inches	Length Between Flanges Inches				
510	4½ x 6	12	38x52	50	10	15	7000	17 to 1	Semi-Steel	3000
513	6½ x 8	20	44x62	61	16	18	15000	20 to 1	Steel	4800
514	7 x 10	30	48x66	66	16	19	20000	20 to 1	Steel	5600

With Link Motion

515	6½ x 8	20	44x62	61	16	12	15000	20 to 1	Steel	4800
516	7 x 10	30	48x66	66	16	15	20000	20 to 1	Steel	5600

These engines furnished complete as shown, with latched hand brake, and all lubricating devices. All gears have cut teeth.

Electric Builders' Hoist**Two Drum, with Reversing Elevator Sheave****Manufactured by Clyde Iron Works, Duluth, Minnesota.**

THE hoist illustrated above has been especially designed for the handling of material elevators, either single or double cage. A shifting lever within easy reach of the operator, controls the band friction clutches on the reversing mechanism, and permits the independent use of the hoisting drum.

A band brake is provided for the drum, and a latched band brake for the elevator sheave, enabling the operator to lock it at any point.

All two-drum builders' hoists have winch head on the front drum shafts only.

Alternating Current, 220-440 Volts, 3 Phase, 60 Cycle**SEMI-STEEL GEARS, CUT TEETH**

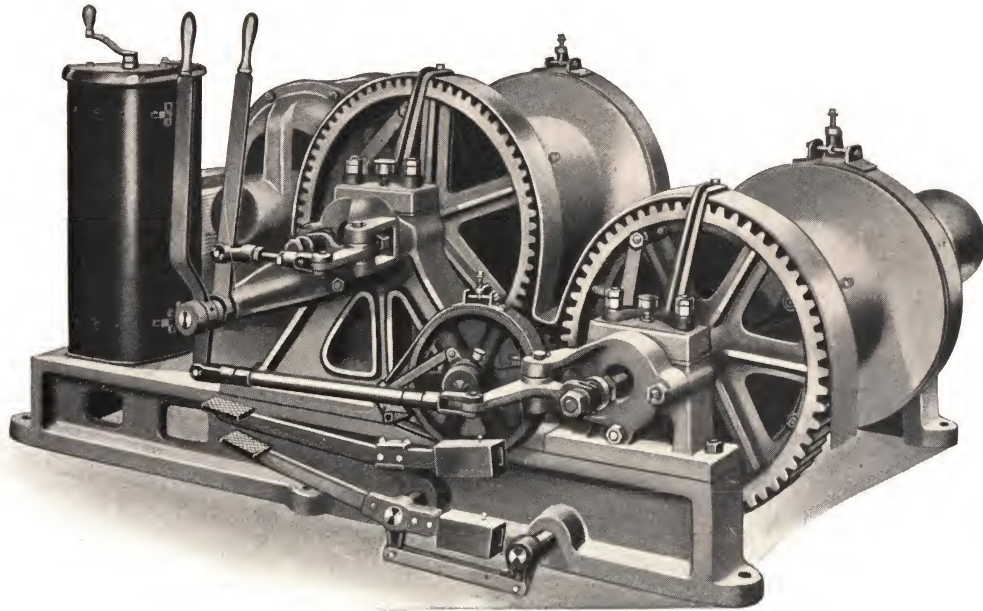
Catalog Number	HOISTING DUTY		MOTOR	DRUMS		SHEAVE			Size of Bed Inches	Approx. Shipping Weight Pounds
	Load Pounds	Feet Per Min.		Diameter Inches	Length Between Flanges Inches	Load Pounds	Feet Per Min.	Diameter Inches		
5851	1000	140	5	6	9	400	320	11	24x60	2300
5852	2000	140	10	7	11	1400	200	14	30x68	3200
5853	3000	140	15	12	16	1400	250	18	37x76	4900
5855	4500	155	30	14	17	2500	250	21	44x90	8100

We can furnish motors for any current or voltage.

Electric Concrete Tower Hoist

Two Drum, Silent Chain Drive

Manufactured by Clyde Iron Works, Duluth, Minnesota.



THE hoist complete includes motor, controller, resistance, automatic brake, foot brakes, winch head, ratchets and pawls.

Solenoid brake, if desired, is furnished at an additional price.

Alternating Current, 220-440 Volts, 3 Phase, 60 Cycle

STEEL GEARS, CUT TEETH

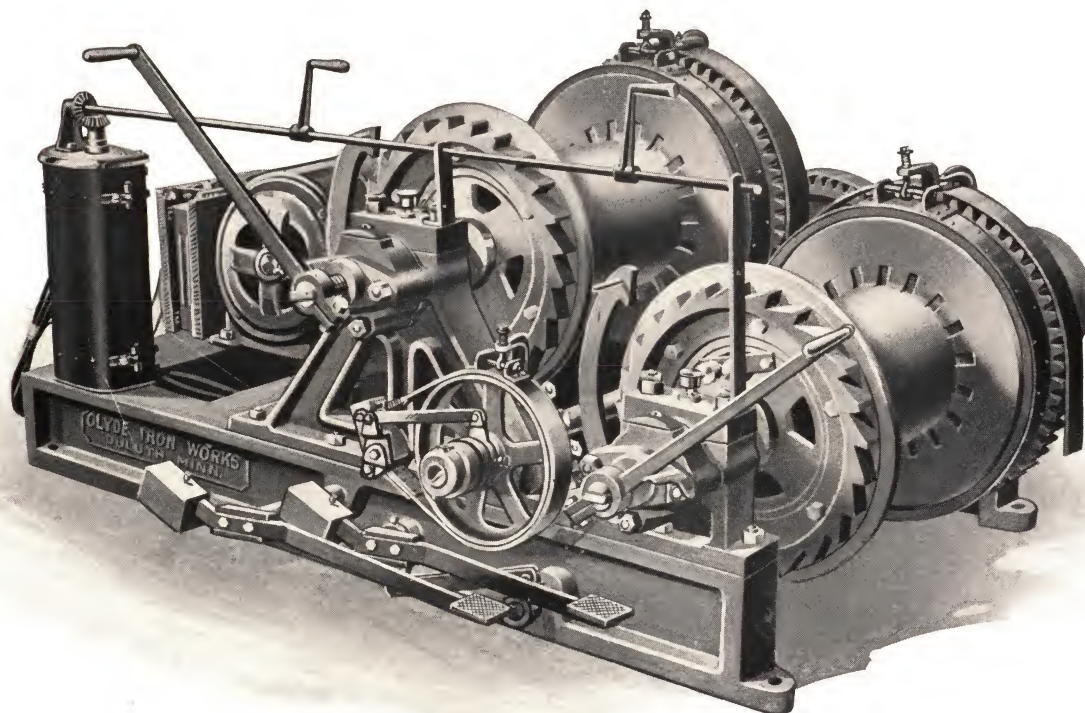
Catalog Number	HOISTING DUTY		MOTOR Horse Power	DRUMS		Size of Bed Inches	Size Concrete Bucket Adapted for	Aprox. Shipping Weight Pounds
	Load Pounds	Feet Per Min.		Diameter Inches	Length Between Flanges Inches			
5780	3500	300	40	16	14	44x 90	$\frac{1}{2}$	8200
5781	3500	500	60	16	14	44x 90	$\frac{1}{2}$	8900
5782	4500	350	60	18	17	51x 93	$\frac{3}{4}$	10000
5783	4500	500	80	18	17	51x 93	$\frac{3}{4}$	10800
5784	6500	250	60	24	23	55x103	1	11800
5785	6500	400	100	24	23	55x103	1	13600
5786	10000	280	100	24	28	62x123	$1\frac{1}{2}$	18000
5787	10000	350	125	24	28	62x123	$1\frac{1}{2}$	19000

We can furnish motors for any current or voltage.

Electric Hoist Two Drum

Silent Chain Drive

Manufactured by Clyde Iron Works, Duluth, Minnesota



THE hoist complete includes motor, controller, resistance, automatic brake, foot brakes, winch heads, ratchets and pawls.

Solenoid brake is furnished at an additional price, if desired.

Alternating Current, 220-440 Volts, 3 Phase, 60 Cycle**SEMI-STEEL GEARS, CUT TEETH**

Catalog Number	HOISTING DUTY		Horse Power	DRUMS		Size Bed Inches	Approximate Shipping Weight Pounds
	Load Pounds	Feet Per Minute		Diameter Inches	Length Between Flanges Inches		
5201	1000	140	5	6	9	24x 60	1900
5202	2000	140	10	7	11	30x 68	2700
5203	3000	140	15	12	16	37x 76	4100
5204	4500	120	20	14	17	44x 90	6700
5205	4500	155	30	14	17	44x 90	6800

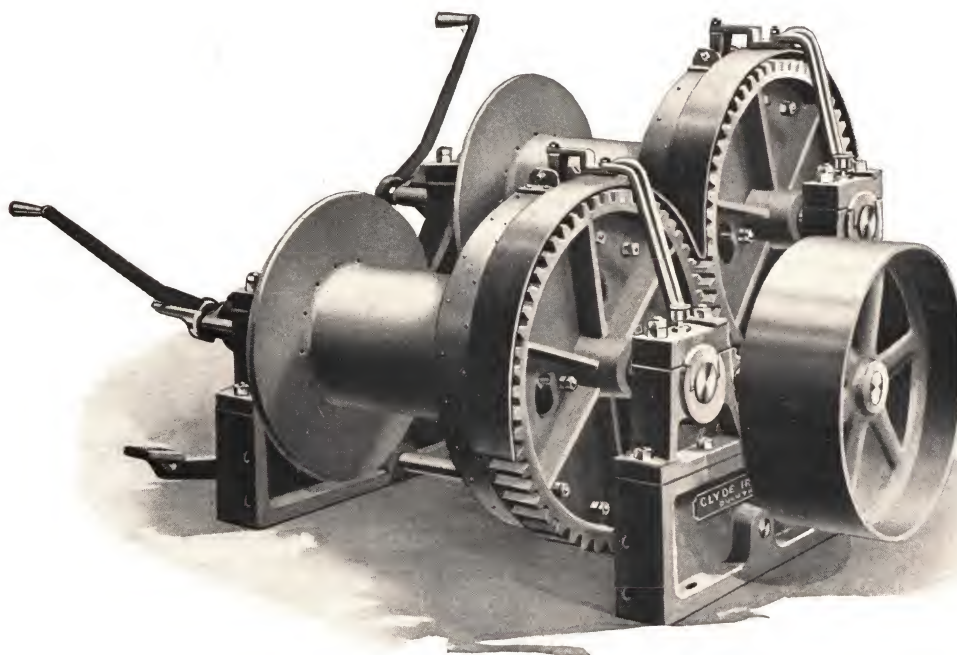
STEEL GEARS, CUT TEETH

5207	7000	160	40	14	22	51x 93	8300
5210	10000	170	60	14	23	55x103	11000
5213	13000	170	80	18	30	62x123	15500
5215	16000	140	80	18	28	62x126	18000
5216	16000	175	100	18	28	62x126	19000
5219	20000	140	100	18	28	62x140	22000
5220	20000	175	125	18	28	62x140	23000

We can furnish motors for any current or voltage.

Belt Hoist - Two Drum

Manufactured by Clyde Iron Works, Duluth, Minnesota.



THE above illustration represents our two-drum belt hoist. This is a compact, substantially built machine and is suitable for general derrick work and would also be very serviceable around docks, warehouses, quarries and railroads. It is operated by a belt from a line shaft or any independent source of power. We can furnish at an extra cost a tight and loose pulley in place of the fixed pulley.

Semi-Steel Gears, Cut Teeth

Catalog Number	Hoisting Capacity Single Line, Lbs.	Normal Line Speed F. P. M.	DRUM		PULLEY			Size Bed Inches	Horse Power to drive, at given Load and speed	Approximate Shipping Weight Lbs.
			Diameter Inches	Length Between Flanges Inches	Diameter Inches	Face Inches	Normal Speed R. P. M.			
2398	1000	125	6	9	15	4	300	24x40	5	1100
2399	2000	125	7	12	20	4½	300	30x45	10	1600
2400	3000	135	12	16	30	6½	180	37x50	15	3000
2401	4500	150	14	17	36	8½	180	44x58	25	4500

Steel Gears, Cut Teeth

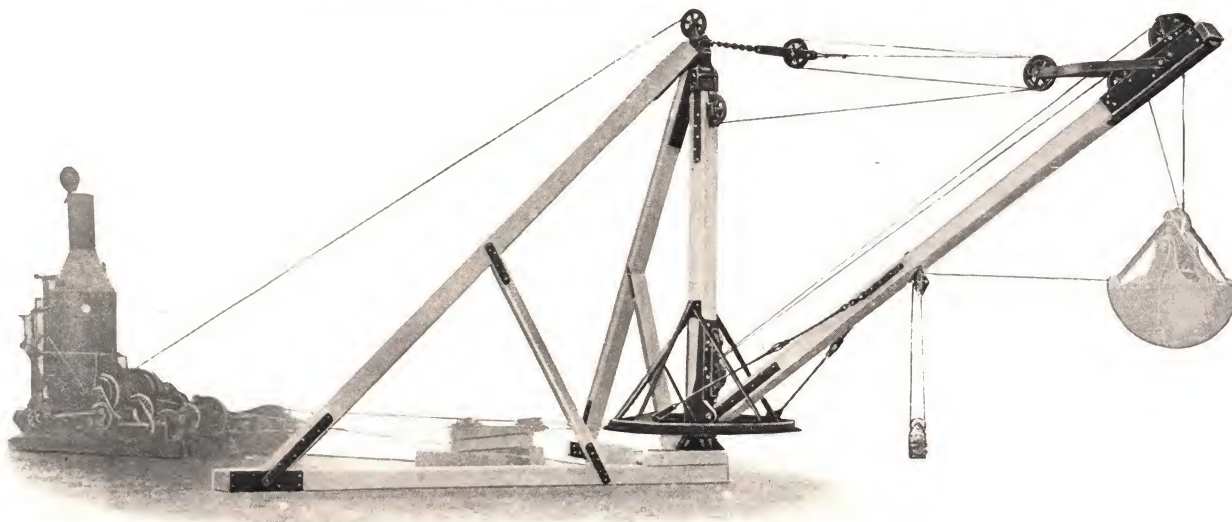
2402	7000	150	14	22	40	10½	190	51x59	40	5500
2403	10000	165	14	23	48	12½	200	55x66	60	6800
2404	13000	180	18	30	56	12½	190	62x78	90	8800

These hoists are furnished complete as shown, with belt pulley, foot brakes, ratchets and pawls, but cannot be furnished with winch heads. Size of pulley may be changed to suit conditions.

NOTE: The amount of horse power necessary to drive these hoists will be increased or reduced in direct proportion as the hoisting speed is increased or reduced.

Clam Shell, Stiff Leg Derricks

Manufactured by Clyde Iron Works, Duluth, Minnesota.



THESE derricks are for rapid handling of material with a clam shell or orange peel bucket. The parts are very strong and exceptionally heavy, though of simple design. The boom line runs from the engine directly to the top of the derrick, so that only the two bucket lines pass through the pivot at the mast bottom. Consequently there is a minimum amount of wear on the wire ropes.

The boom end sheaves are carefully guarded to prevent the bucket lines coming off when slack, and long rollers underneath the boom end take the side pull of the bucket ropes when slewing the load. This saves the boom end sheaves from damage, a matter usually neglected in ordinary fittings. The sheaves are placed tandem on the center line of the boom end, and thus avoid twisting stresses in the boom timber.

All the sheaves have self-lubricating bronze bushings and are grooved for wire rope.

The fittings include all castings, straps, sheaves, and bolts for a complete derrick.

The fittings do not include bull wheel, guide sheaves for bull wheel ropes, boom truss rods, clam shell bucket, and ropes, which are extras, and will be furnished at an additional price.

Complete Sets of Fittings

Catalog Number	8075	8076	8077	8078	8079
Size of Bucket (Cubic Yards)	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3
Nominal Capacity—ordinary hoisting work (Tons)	3	5	8	12	18
Size of Mast (Inches)	10x10	12x12	14x14	16x16	18x18
Length of Mast to use with Longest Untrussed Boom	22 ft.	26 ft.	30 ft.	33 ft.	36 ft.
Size of Boom (Inches)	8x8	10x10	12x12	14x14	16x16
Longest Boom—Untrussed	35 ft.	40 ft.	45 ft.	50 ft.	55 ft.
Size of Stiff Legs and Sills (Inches)	8x8	10x10	12x12	14x14	16x16
Longest Stiff Leg without Side Truss	40 ft.	45 ft.	50 ft.	55 ft.	60 ft.
Approximate Shipping Weight (Lbs.)	2900	3900	5500	8500	11600

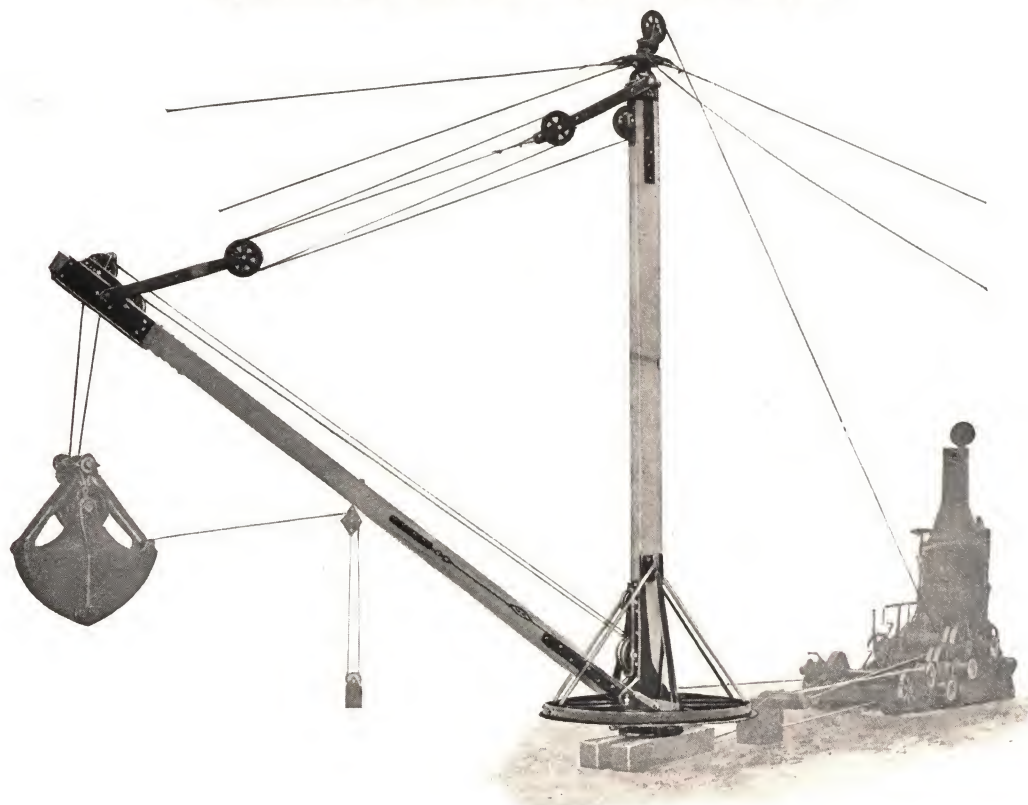
IMPORTANT: The above capacities assume a length of boom one and one-half times the length of the mast. Digging with a clam shell or orange peel bucket is the hardest and roughest work done with a derrick and requires the use of a larger size than ordinary hoisting. For this reason large derricks are listed with comparatively small bucket capacities. The life of an outfit is greatly lengthened and trouble avoided by allowing an excess of strength for this class of work.

When ordering state:

Size of bucket to be used; style and make of bucket; heaviest load to lift; length of mast; length of boom, size and style of engine.

Clam Shell, Guy Derricks

Manufactured by Clyde Iron Works, Duluth, Minnesota.



A CLAM SHELL or orange peel bucket on a properly rigged, quick acting derrick, constitutes one of the most efficient means of handling materials and doing many kinds of excavating. Clyde clam shell derricks embody all the superior features of the Clyde standard derricks as to strength, convenience, simplicity and interchangeability of parts. The boom line runs from the engine directly to the top of the derrick, so that only the two bucket lines pass through the pivot at the mast bottom, consequently there is a minimum amount of wear on the wire ropes.

The boom end sheaves are carefully guarded to prevent the bucket lines coming off when slack, and long rollers underneath the boom end take the side pull of the bucket ropes, when slewing the load. This saves the boom end sheaves from damage, a matter usually neglected in ordinary fittings. The sheaves are placed tandem in the center line of the boom end and avoid twisting stresses in the boom timber.

All sheaves are supplied with self-lubricating bronze bushings.

The fittings include all castings, straps, sheaves, and bolts for a complete derrick.

The fittings do not include bull wheel, guide sheaves for bull wheel ropes, boom truss rods, clam shell bucket, and ropes, which are extras, and will be furnished at an additional price.

When ordering state:

Size bucket to be used,
Make and style of bucket,
Heaviest load to lift for general hoisting service,

Length of boom,
Size and style of engine to operate derrick,
What length of guys can be used.

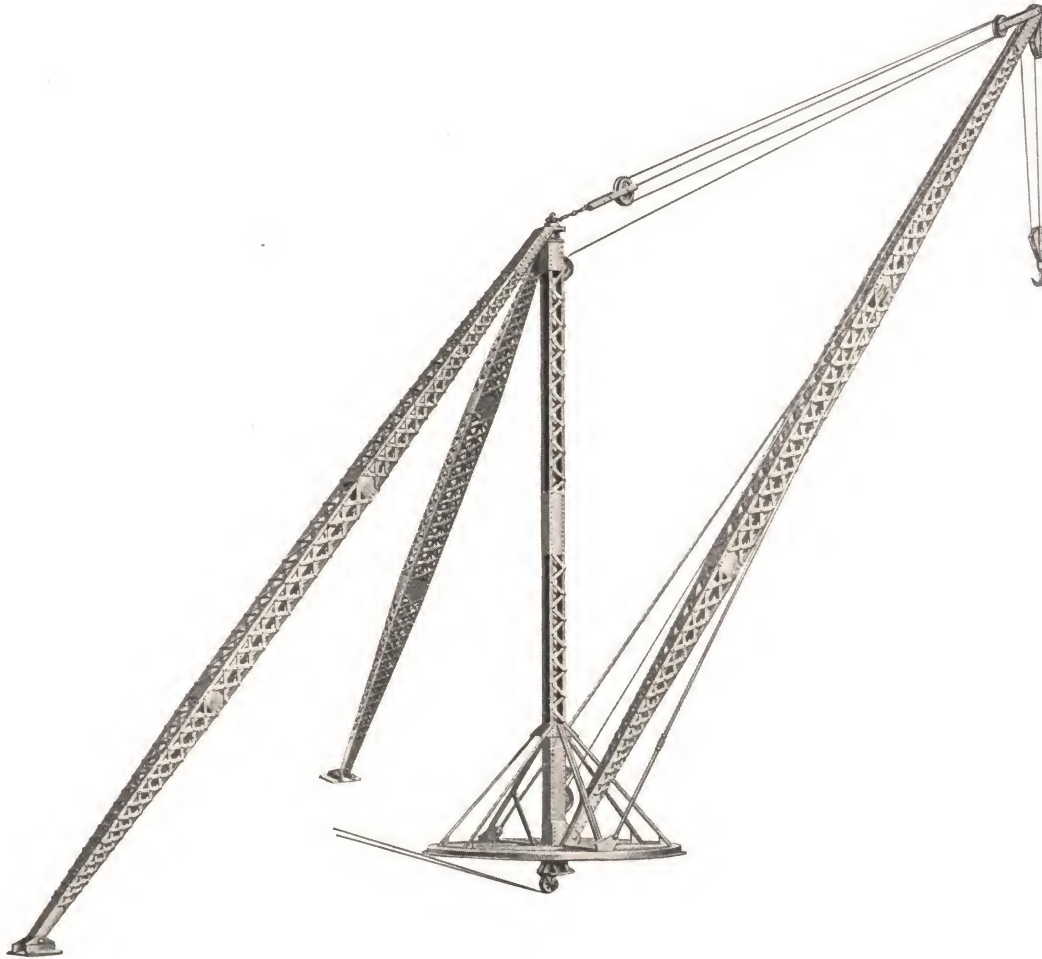
Complete Sets of Fittings

Catalog Number	7076	7077	7078	7079	7080
Size of Bucket (Cubic Yards)	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3
Nominal Capacity—ordinary hoisting work (Net Tons)	3	6	10	16	24
Size of Mast (Inches)	10x10	12x12	14x14	16x16	18x18
Longest Mast—Untrussed	42 ft.	50 ft.	55 ft.	60 ft.	65 ft.
Size of Boom (Inches)	8x8	10x10	12x12	14x14	16x16
Longest Boom—Untrussed	34 ft.	40 ft.	45 ft.	50 ft.	55 ft.
Approximate Shipping Weight (Lbs.)	2350	2900	3800	5700	7700

IMPORTANT: Digging with clam shell or orange peel buckets is the hardest and roughest work done with derricks and requires the use of larger sizes than ordinary hoisting. For this reason, large derricks are listed with comparatively small bucket capacities. *The life of an outfit is greatly lengthened and trouble avoided, by allowing an excess of strength for this class of work.*

Steel Stiff-Leg Derricks

Manufactured by Clyde Iron Works, Duluth, Minnesota.



THE illustration shows our Standard Steel Stiff-Leg Derrick. Mast is of latticed (larger sizes of plated) channel construction. Boom and stiff-legs of latticed angle construction, with double lacing. Stiff legs are of channel construction in the shorter lengths.

Sheaves are grooved for wire rope and fitted with self lubricating bronze bushings.

Complete derrick includes mast, boom, stiff legs, stiff leg anchor fastenings, all castings, straps, sheaves, blocks, bull wheel and guide sheaves.

Sills and wire rope equipment are not included, but will be furnished at an additional price.

Derrick shown is for regular derrick work, but derricks for clam shell work will be furnished at same price.

Steel Guy Derricks

Manufactured by Clyde Iron Works, Duluth, Minnesota.



THE illustration is of our standard Steel Guy Derrick.

Sheaves are grooved for wire rope and fitted with self lubricating bronze bushings, unless otherwise ordered.

Complete derrick includes mast, boom, all castings, straps, sheaves, blocks, bull wheel and guide sheaves.

Wire rope equipment is not included, but will be furnished at an additional price.

Derrick shown is for regular derrick work, but derricks for clam shell work will be furnished at same price.

M. & M. Form Clamps

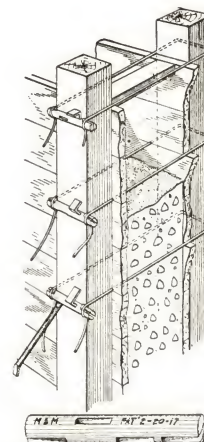
M. & M. Wire Clamps Work Efficiently on Walls, Columns, Beams and Soffits



Walls are wired with M & M Form Clamps with one fourth the labor it takes to twist up the wires and the wire is not weakened.

This clamp makes it easy for one man to do the work of two or three men in wiring concrete forms and do the job with less waste of material and do it much better and faster.

When you finally do look into this big labor saver as you will some day and you finally try it you are going to regret that you didn't know about it long ago, it will save you so much money.



Made of Maleable Iron

Note Three Positions of Locking to Each quarter turn.

How to Place and use Either Size of M. & M. Clamp

Place the clamp against the studding or timber. Lay wires in slots at each end. Insert the handle in center slot, turn it down and draw forms into place. When wires are taut, lock the clamp by dropping angle iron into slot above handle. Note that there are three positions in each quarter turn of clamp in which angle iron lock can be placed so that clamp can be locked in any position.

The only tool required is the handle shown in cut above. A handle is furnished with each 100 clamps. A pinch bar can be used, or any piece of iron that will fit into the center slots.

No. 1 clamp can be used on 2x4's, 2x6's, 4x4's, 4x6's or 4x8's, shipping weight 85 pounds per 100 clamps.

No. 2 clamp, the smaller size, can be used on 2x4's and 2x6's, shipping weight 78 pounds per 100 clamps.



M & M Form Clamps are placed on columns as fast as steel column clamps

You know that cutting labor costs is one feature of your business that you must watch constantly.

Labor saving machinery and devices of all kinds must be investigated if you expect to keep up with modern rapid progress.

For this reason you should know at once all about the M. & M. WIRE CLAMP because it is already in use by most of the larger contractors.

M. & M. Shore Clamps



If you keep detailed costs on your jobs you know that an ordinary scabbed splice costs you in labor, lumber and nails from 30c to 35c each. This same splice can be made with the M. & M. No. 4 Splicing Clamps at a cost of 2c to 4c each, giving you a clean saving of at least 25c to 30c a splice.

You throw away each year more money buying nails, lumber for cleats, lumber cut off the shores, labor to cut and nail up the lumber and inconvenience of handling than the M. & M. Splicing Clamps will cost you.

M. & M. Shore Clamps

(Continued)

Using M. & M. Splicing Clamps all of this labor, nails and lumber can be saved and the clamps, therefore, easily pay for themselves when they have been used not over five times. The savings made on one job alone will more than pay for the clamps. Why continue making clumsy shores that are hard to move and pile and a lot of fire wood out of good lumber? It is not necessary to square up both ends of the timbers. You can standardize your lumber in stock lengths.

The clamps are placed by sliding them on the timbers inclining in the direction of the load, then drive the wedges. The clamps are quickly removed by driving the wedges back and releasing. This makes another saving when the forms are taken down.

You are able to lengthen and shorten your shores very easily and economically. When the splice is made the shore is ready to erect, it does not slip or have to be held together when placing. The clamps are made to work on 4x4's. They can be used for shoring up concrete form work including beams and slabs or for erecting stagings.

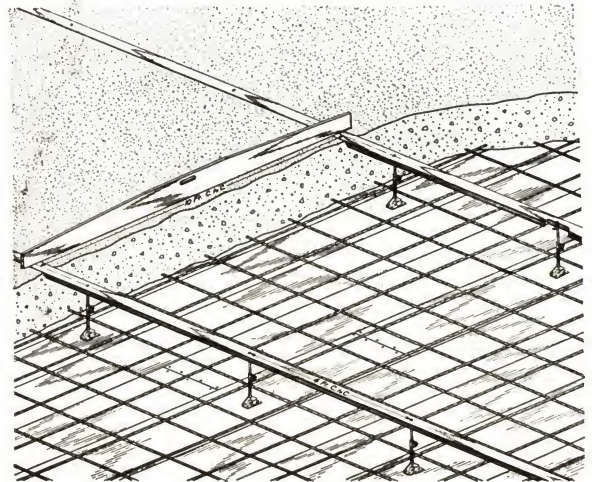
These clamps give you a strong, safe and efficient method of making a splice.

The clamps require no notching, cleating, blocking or nailing to hold them in place when erecting. Your men do not waste time hunting around the job for special jacking tools and special tools to place the clamps but use a hand-ax or heavy hammer which is always at hand.

The M. & M. Splicing Clamps have no mechanical parts to jamb, break or get out of order. The clamps are all in one piece as a rivet holds the wedge so that it is impossible to slide it out of the yoke.

From the standpoint of capital invested in equipment this clamp makes the cheapest adjustable shore possible as it can be quickly placed or released, releasing your lumber for building wall forms or in other places around the job, as the lumber is clean and in full length pieces.

Contractors properly equipped for speed and economy are bound to make money. You will make no mistake in ordering a supply of M. & M. Splicing Clamps for your work, as they are an assured success having been tested thoroughly and proven a very large LUMBER, NAIL and LABOR SAVER.



M. & M. TARGETS

The M. & M. Targets are very simple, rigid and inexpensive devices for leveling concrete. They permit you to pour concrete and level it on the spotting method or to screed your concrete with a straight edge.

The Targets used with the caps for screeding the concrete slabs give you a very rapid method of setting up screed strips and permit you to gauge the depth very accurately. The caps are made standard for 5/16 inch holes and hold the quarter inch rods very rigidly. A 1x2 strip should be used twelve foot long, spacing the Targets about four feet on centers as shown in the cut.

The M. & M. Targets can be used for leveling tile and joist between the rods. The same method is used where metal pans are used in place of tile. They can be used on flat slab work as the Targets are small and there is ample room to place them between the rods either on the spotting method or screeding method.

They can be set with an instrument if you desire. This permits you to pour level slabs or on a slope, which is a great advantage over other methods.

A saving of 1/16 inch of concrete on a slab more than repays you for the entire expense of setting the Targets up and the cost of the Targets. Therefore, the expense is very small.

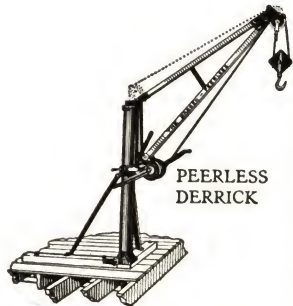
We recommend the M. & M. Targets to contractors who are doing a large amount of concrete work. We know they will more than repay the contractor by the labor and concrete which they will save. The advantage of being very quickly made and set up and the unlimited adjustability which can be obtained makes them a very convenient Target.

Write us today for free sample and price, or, better still, tell us to send you 100 M. & M. Targets as a trial order.

Sasgen Derricks and Hoists

PEERLESS

**Swings full circle.
Built of all steel.
Fittings malleable.**



Has self-lubricating bushings, load and boom brake, can be used, hand, horse or power. For hoisting joists, timbers, iron, stone, terra cotta, reinforcing bars, wheelbarrows, etc. Capacity, 1,800 lbs., weight 275 lbs., height 8 ft., swing 10 ft. Equipped with 125 ft. crucible steel cable, block, cleats and bolts for fastening, complete, ready for work.

Drum holds 175 ft. Cable.

IMPROVED SETTER DERRICKS



Have many improvements over the old style Setter Derricks. The top frame is made of best malleable iron, equipped with two sheaves, does away with the block on top, increases the hoisting height about two feet, extends forward keeping load from scraping derrick, has lugs for guy lines in front and back, and clamps for fastening extension pole if necessary.

Bottom and side pieces are connected with two malleable castings. Gears are malleable.

Can be furnished up to 26 ft. in length and 3 ton capacity. Fish tackle to swing derrick out and in also supplied.

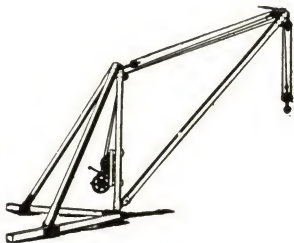


Top Point

Regular

Capacity	Length	Capacity	Length
3,000	18	4,000	18
3,000	20	4,000	20
3,000	22	4,000	22

STIFF-LEGGED DERRICKS — SPLIT MAST AND BOOM



Our Stiff-Legged Derricks are built with split mast and boom, fitted throughout with crucible steel fittings, making the derricks light and strong and easy to set up. They can be used by hand or power and for the above reason are especially handy on buildings. Gears and frames of our double hoisting winch are also made of crucible steel, which means safety and no breaking of gears. Our 1-ton bottom sills work hinge-like in front and can be set at angle desired.

We can furnish our 2, 3 and 4-ton split mast and boom Stiff Legged Derricks for Clamshell work.

These derricks can be furnished in—

- 1-TON Capacity with boom from 12 to 24 feet long
- 2-TON Capacity with boom from 18 to 30 feet long
- 3-TON Capacity with boom from 20 to 40 feet long
- 4-TON Capacity with boom from 30 to 50 feet long

STANDARD

**Swings full circle. Built of all steel.
Fittings malleable.**



Is equipped with a geared winch. Can be used hand or power. Built strong and durable.

Has boom and load brake. For hoisting loads 1,500 to 2,500 lbs. by hand or power our STANDARD CIRCLE SWING DERRICK has no equal and is the only full circle swing builder's derrick of that capacity.

Capacity 2,500 lbs., weight 350 lbs., height 8 ft., swing 10 ft. Equipped with geared winch, 150 ft., 5/16 in. steel cable, block, cleats for fastening, complete, ready for use.

Drum holds 275 ft. cable.

POLE DERRICKS



Are used by many contractors, builders, stone and iron setters, setting trusses, timbers, girders, heavy joists, columns, stone, iron beams, etc. and they are about the most suitable and practical derricks for that purpose. Our Pole Derricks are equipped with a crucible steel top sheave frame, which acts as a block, and extends in the front, so the load can be hoisted without scraping pole. Has lugs for guy lines and sheave in back to bring cable to hoisting drum. Has a bottom sill equipped with rollers, well braced to pole. The 4 x 6 Pole Derrick is equipped with winch, not geared, 100 feet steel cable and block, the 6 x 6 with geared winch, 125 feet steel cable and block, the 6 x 8 with geared winch, 125 feet steel cable and block, the 8 x 8 with double purchase winch, 125 feet steel cable and block.

Information on longer lengths gladly furnished.

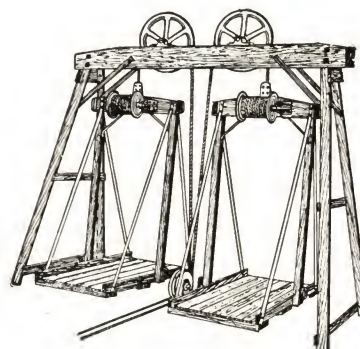
SIZE 4 x 6 — Cap. 1,400 to 1,500, Ft. 16-18-20.

SIZE 6 x 6 — Cap. 2,500 to 3,500, Ft. 18-20-22.

SIZE 6 x 8 — Cap. 4,000 to 5,000, Ft. 18-20-22.

SIZE 8 x 8 — Cap. 8,000 to 10,000, Ft. 18-20-22.

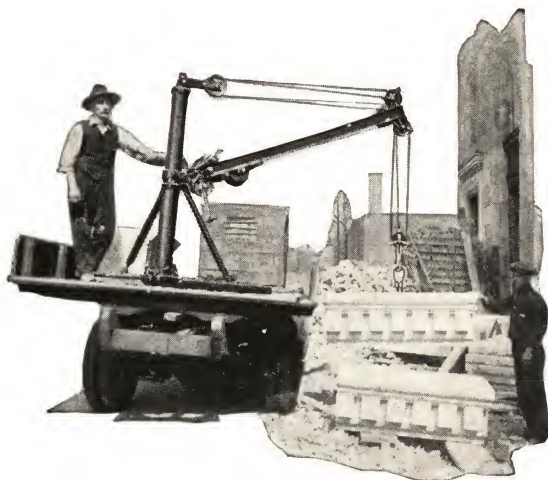
MATERIAL ELEVATOR



Double or Single Cage

Cages are built of oak wood and well braced with iron rods. The truss beam is oak wood firmly bolted together, provided with suitable sheaves mounted on steel shafts, equipped with malleable iron boxes.

Sasgen Derricks and Hoists

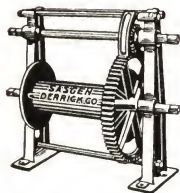


SASGEN IDEAL TRUCK DERRICK

Sasgen Ideal Track Derrick can be used to great advantage for loading and unloading. It can be placed on platform or on the back or front end of the truck, as shown in photo, or on platform hitched to gondola cars, unloading same. The boom swings a full circle, can be raised and lowered to suit work, and can be operated by one or two men, and in many cases one man can do the work of three or four men, loading and unloading trucks and cars. Derrick has a capacity of 2,000 pounds, with boom six or eight feet. With boom ten feet, derrick will have a capacity of 1,500 to 1,800 pounds.

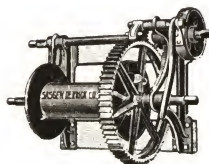
With boom 11 to 15 ft., equipped with extra braces to top of mast, derrick will have a capacity from 1,500 to 2,000 pounds. This derrick is equipped with winch for load and boom, block and cable to reach 25 ft. from derrick, complete all ready for use.

Single Purchase Truck Winch



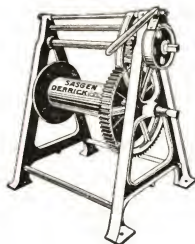
These winches have drums 6 inches in diameter and in a selection of lengths varying from 14 to 24 inches. Lifting capacity two men on two lines, 3,000 pounds., and on four lines 6,000 lbs.

Single Drum Single Purchase Winch



These winches have drums ranging from 5 inch diameter, 12 inches long to 7 inches diameter and 20 inches long. Lifting capacity two men on two lines 3,000 pounds and on 4 lines, 6,000 pounds.

Single Purchase Hoisting Crab

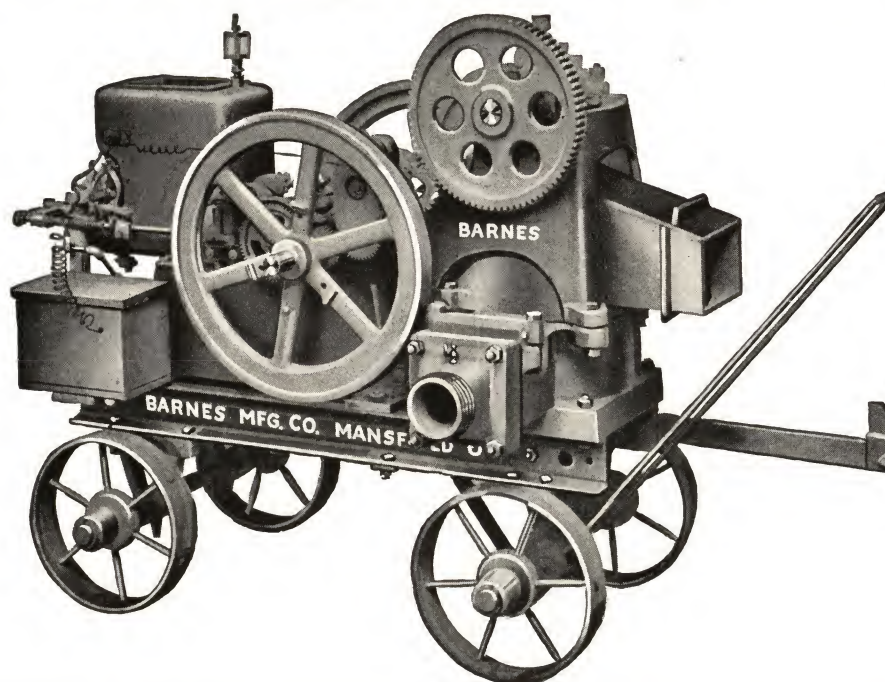


These winches have drums ranging from 5 inch diameter, 16 inches long to 7 inch diameter and 22 inches long. Lifting capacity two men on 2 lines, 3,000 pounds, and on 4 lines, 6,000 pounds.

We are in a position to furnish any of the items of the famous Sasgen line and carry certain items in our Duluth stock.

Portable Pumps and Pumping Outfits

GUARANTEED
CAPACITY
10,000 GALLONS
PER HOUR



"ANTI-SPLASH"
POWER DIA-
PHRAGM PUMPS

The "ANTI-SPLASH" Power Diaphragm Pumps are equipped with completely covered spout which effectively prevents splashing. The suction valve can be removed without disturbing the suction hose. The discharge valve is spring loaded to insure quick action. All gearing is heavy machine cut, of stub-tooth type, eliminating gear trouble.

The diaphragm can be changed in 20 minutes without removing the jack.

These outfits are recommended for handling muddy water.

SPECIFICATIONS

Outfit No.	Engine H. P.	Pump Size Suction	Capacity Gallons per Hour	Maximum Lift	Weight on Truck	Over all Length
301	1½	3 ins.	4,000- 5,000	15	775	4 ft. 0 in.
S302	2½	4 ins.	10,000-12,000	20	1075	4 ft. 0 in.
302	3	4 ins.	10,000-12,000	25	1175	4 ft. 0 in.
303	3	Two 4 ins.	20,000-24,000	25	1650	5 ft. 0 in.

Direct Connected Centrifugal Outfits



Outfit 215

A dependable Centrifugal Pumping Outfit for gravel washing, irrigating, drainage work, quarry pumping, draining clay pits in brick plants, etc.

The four cylinder heavy duty truck type engine is equipped with high tension magneto and float feed carburator. A radiator and fan cooling system is regular equipment; the muddy water which this outfit will handle is not practical for engine cooling.

A flexible coupling connects the pump and engine. A large oil ring bearing supports the pump shaft and relieves the engine of all strain.

The outfit is entirely self-contained and ready to run. Just fill the tank with gasoline, prime the pump and start the engine.

When ordering, please give us the suction lift, the discharge head, length of suction and discharge pipes and capacity wanted.

Outfit No.	Size of Pump		Engine	Capacity Gallons Per Minute	Total Head Feet	Shipping Weight On Truck
	Suction Inches	Discharge Inches				
215	4	3	15 h. p. Le Roi	300	65	1400
216	4	3	30 h. p. Hercules	300	100	1800
217	4	4	15 h. p. Le Roi	500	35	1450
218	4	4	30 h. p. Hercules	900	35	1850

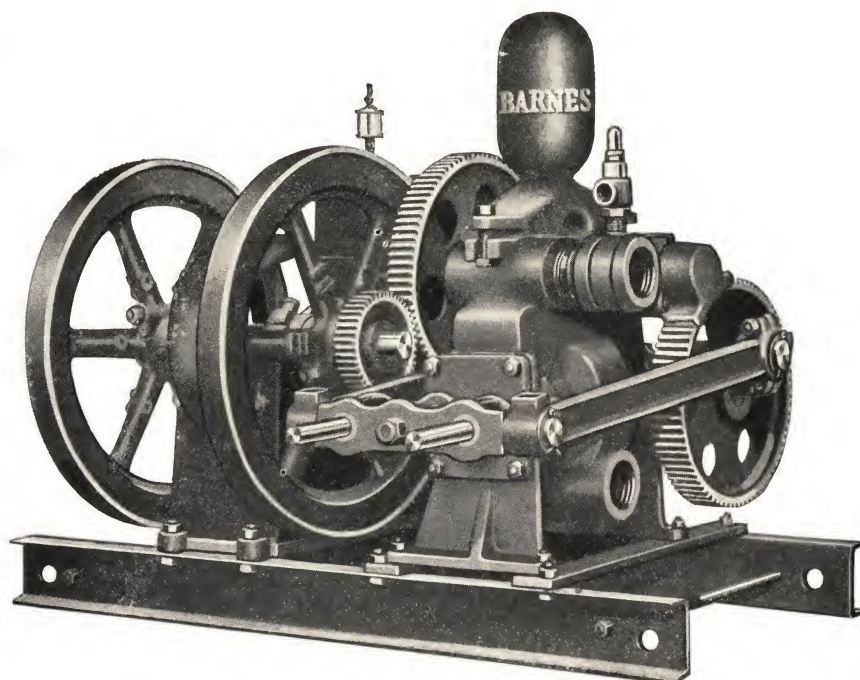
Furnished also with 2 cylinder engine.

Portable Pumps and Pumping Outfits

TYPE "S" PUMPING OUTFIT

For any pressure
up to 125 lbs.

Also furnished on
hand truck.



Furnished complete with Horizontal Engine, Magneto Ignition, and Relief Valve.

Patented

Outfit No.	H. P. of Engine	Size of Pump		Size of Suction and Discharge Inches	Capacity Gallons Per Hour	Pump R. P. M.	Pressure Pounds Per Sq. In.	Total Head in Feet	Approx Weight Pound
		Piston Diameter Inches	Stroke Inches						
H70	1½	2½	4	1¼	400—480	50	125	285	425
H71	1½	3	5	1½	600—690	40	125	285	550
H71B	3	3	5	1½	750—870	50	125	285	720
H72	1½	4	5	2	1080—1260	40	75	175	750
H72A	3	4	5	2	1200—1410	45	125	285	800
H73	3	5	5	2½	1680—1950	40	75	175	875
H73B	5	5	5	2½	2100—2460	50	125	285	1225
H74A	5	6	6	3	3600—4260	50	100	230	1325

NOTE: Truck not furnished unless specified on order.

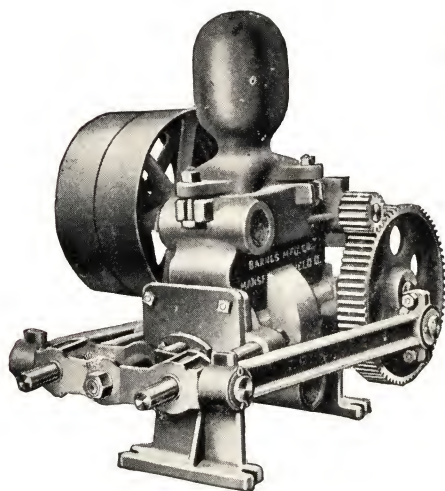
TYPE "S" DOUBLE ACTING POWER FORCE PUMP

For Belt Drive—Maximum Pressure 125 lbs.

Built with Machine Cut, Stub Tooth Gears, Bronze wing type valves, all valves are located above the cylinder so that the pump is always primed.

Especially adapted to furnishing water supply for Factories, for Sprinkler Fire Systems, Boiler Feed Water, etc.

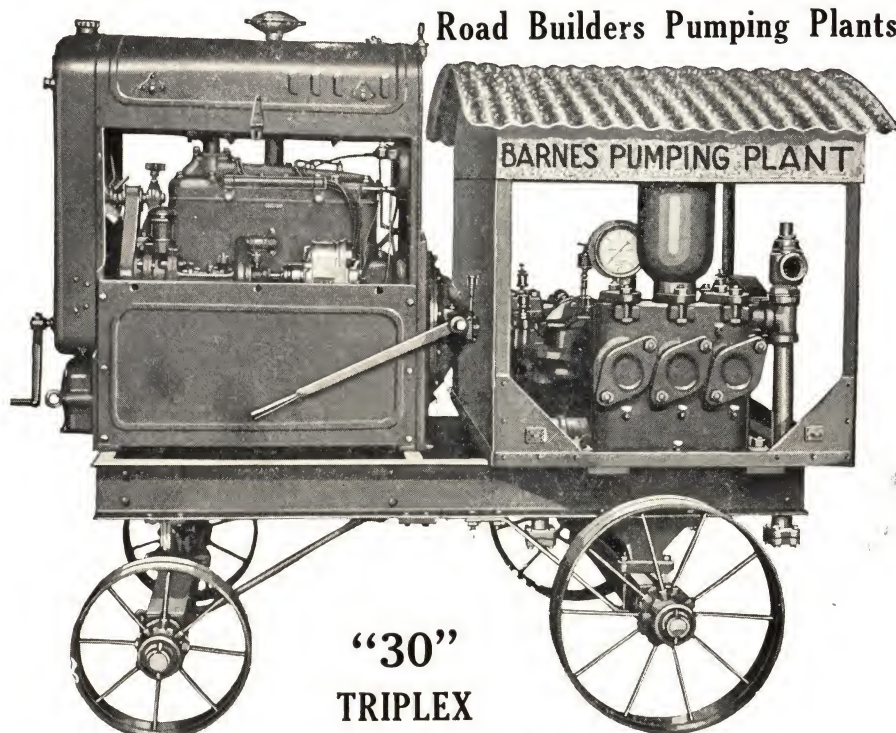
Can be supplied with hydraulic packed piston for Hot Water, Oil or Gasoline.



Cylinder		Revolutions per minute	Gals. per min. Displacement	Pressure lbs. Per Sq. Inch.	Total Head in Feet.	Size of pipe	Gear Ratio	Dim. Tight and Loose Pulleys Inches.	Weight lbs.
Diam. Ins.	Stroke Ins.					Suction and discharge in.			
2½	4	50	7	125	285	1¼	5 to 1	12x2½	165
3	5	50	14	125	285	1½	5 to 1	14x2¾	230
4	5	50	26	125	285	2	5 to 1	15x3¾	335
5	5	50	37	125	285	2½	5 to 1	16x4½	470
6	6	50	71	125	285	3	5 to 1	20x4¾	665

Portable Pumps and Pumping Outfits

Road Builders Pumping Plants



40
60
80
gallons
per minute
400 to 500
pounds
pressure

"30"
TRIPLEX

Give your paving job a reliable water supply!

These 4 Cylinder Engine Triplex pumps will force water 10 miles if necessary, they are built for hard work and have made an enviable record on all paving jobs, no repairs required for any outfit in operation last year.

4 Cylinder 15—30—45—H. P. power unit with radiator and fan, air cleaner, governor and full accessories, multiple disc clutch 500 pounds press Triplex or Quadruplex Outside Packed Pump, Electric steel and Malleable Iron working parts, intermediate gears run in oil. Alloy Bronze Valves, Lockup Housing.

SPECIFICATIONS

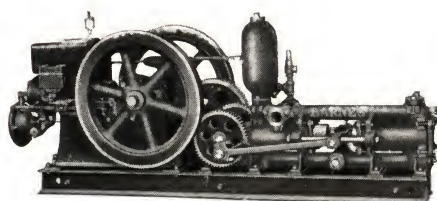
Model	Size of Pump		Size of Engine			Size of Pipe		Dis- place ment capa- city Gal. Per Hr.	To- tal Hd. ft.	Pres- sure Lbs. per sq. in.	Code	Ap- prox Wt. lbs.	Overall dimen- sions		Size of Truck Wheels		
	Plunger Dia. in.	Stroke in.	H. P.	Bore in.	Stroke in.	Suction in.	*Dis- charge in.						Lgth. in.	Width hub to hub in.	Front dia. in.	Rear dia. in.	Face of Tire in.
40	3½	6	30-45	4	5	3	2, 2½-3	4800	1150	500	Quran	4500	93	65	18	24	5
30	3½	6	30-45	4	5	2½	2-2½	3600	1150	500	quaver	4000	87	65	18	24	5
20	3½	6	15-18	3½	4½	2½	2-2½	2400	1035	450	Quiz	2800	84	60	16	22	4

*The discharge is regularly reduced to 2 inches, unless otherwise specified.

DUPLIX OUTSIDE PACKED PUMPS

For Long Distance Pumping—Jetting Piles Etc.

Outfit No.	H. P. of Engine	Size of Cylinder Diam. Inches	Pump Stroke Inches	Size Suct. and Disch. Ins.	Capacity Gallons per Hour	Pump R.P.M.	Total Head Feet	Pressure Lbs. per Sq. In.	Shipping Weight Pounds
60	3	3¼	5	1¼	900-1075	50	400	175	1100
60A	5	3¼	5	1¼	900-1075	50	515	225	1350
61	5	4¼	5	2	1500-1850	50	460	200	1550
62	7	5½	6	3	3000-3600	50	285	125	2150
62A	9	5½	6	3	3000-3600	50	460	200	2650
63	7	4½	6	2½	2100-2400	50	460	200	2075
63A	9	4½	6	2½	2100-2400	50	635	275	2600
64	7	3½	6	2	1200-1500	50	809	350	2000
64A	9	3½	6	2	1200-1500	50	1000	450	2550



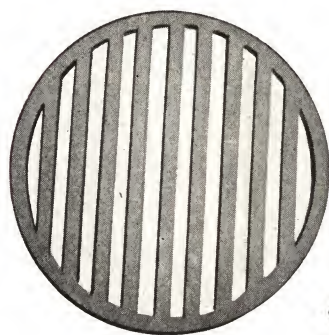
"Hercules" High Pressure Outside Packed Pumping Outfit with horizontal engine, Also Furnished on Hand Truck

On 7 and 9 H. P. outfits a clutch is furnished between pump and engine for ease in starting.

SALAMANDERS

For Builders, Contractors, Shops, etc.

Our Salamanders are substantially designed and built for hard service.



Cast Iron Grate



The body and pan are of heavy steel and the grate of cast iron. The ash pan is raised from the ground and projects beyond the edge of the body to prevent the ashes from dropping out.

For temporary heating in cold weather, for drying plaster and for use in buildings when the regular source of heating is not available, these Salamanders will be found useful and economical. They will burn wood, coal or coke.

Body 17 inches in diameter, 24 inches high and height over all 34 inches. Weight, 40 lbs.



MASON'S SALAMANDER OR MORTAR BOARD HEATER

Considerably smaller and of lighter weight than the Salamander shown above, because it is generally used on a scaffold, but none the less strongly built. Low in cost and will greatly increase the efficiency of brick layers and masons. Will burn coal, coke or wood.

CARBIC PORTABLE LIGHTS AND CARBIC CAKES

STANDARD NO. 2 CARBIC LIGHT

USES NO. 20 CARBIC CAKES



For general all-around requirements, this light is considered the most adaptable. Its light operating weight, making it readily portable, and the fact that it can be charged in less than three minutes to burn continuously for twelve hours without any attention, have earned for it a genuine popularity with contractors, railroads and others everywhere.

NO. 1 CARBIC LIGHT

USES NO. 20 CARBIC CAKES



The burner and reflector equipment on this unit is identical to that of our standard No. 2 light. The volume and distribution of light, therefore, are the same. Those not requiring more than six hours burning period often prefer this light to the No. 2, because of its lighter weight.

NO. 3 CARBIC LIGHT

USES NO. 20 CARBIC CAKES



The principal features of this light are the double burner arrangement, permitting the use of one or two burners at a time, and the extra volume of light, which is obtainable from this single unit. The burners and reflectors are the same as on lights Nos. 1 and 2.

CARBIC "CADET" LIGHT

USES NO. 5 CARBIC CAKES



This light is extensively used by fire departments, railroad wrecking crews, mines and many others requiring extreme portability. It is easily carried by one man and is equipped with water-tight cover to prevent splashing of the water from the tank.

SPECIFICATIONS OF CARBIC LIGHTS

STYLE NO. OF LIGHT	2 Std.	1	3	Cadet
Height Ref. Up	79 in.	75 in.	79 in.	56 in.
Height Ref. Down	45 in.	42 in.		36 in.
Weight Empty	36 lbs.	35 lbs.	79 lbs.	16 lbs.
Weight Charged	115 lbs.	75 lbs.	200 lbs.	30 lbs.
Weight Shipping	75 lbs.	63 lbs.	118 lbs.	37 lbs.
Size of Reflector	13 in.	13 in.	13 in.	10 in.
Width at Base	14 in.	13 in.	14 in.	11 in.
Burns	12 hours	6 hours	12 hours	5 hours

Uses Carbic Cakes

Size No.	20	20	20	5
Full charge	4 Cakes	2 Cakes	8 Cakes	4 Cakes

CARBIC CAKES

FOR USE IN CARBIC LIGHTS

Carbic Cakes are made from highest grade carbide treated and compressed into briquet form by a special process and represent not only the most efficient and economical means of supplying gas for portable lights, but by far the safest. The method of generating, coupled with the special composition of the cake, insures a clear, white, smokless flame of great illuminating power.



100 lb. Drum
(40 Cakes)
No. 20 Size

Each cake contains a guaranteed gas yield according to its size, thus eliminating guess work in charging. There is no waste of cake and the light can be used intermittently.



75 lb. Drum
(110 Cakes)
No. 5 Size

Carbic Cakes are packed in strict accordance with Fire Underwriters' rules in sheet steel drums and will last indefinitely. Each cake is wrapped separately in paper, making it convenient and easily handled.

Carbic is a standardized product,—several thousand tons being shipped each year for consumption exclusively in Carbic apparatus.

CARBIC LIGHTS IN ACTION



Carbic lights represent the highest development in portable lighting equipment and have proven, by practical use on thousands of construction and emergency operations at all points of the compass and under varying climatic conditions, that they fill every exacting requirement of a powerful, portable light, the essential qualities of which are efficiency, portability, economy and simplicity, coupled with absolute safety.

All Carbic lights consist of but three parts. They cannot be wrongly assembled.

Charging may be done by even the most inexperienced labor and requires only a few minutes time.

Carbic lights are equipped with all-metal, storm-proof burners, also with special swing joints, permitting the adjustment of the reflector to any angle without moving the light itself.

Carbic lights are listed as standard by the Fire Underwriters' Laboratories.

CARBIC CAKES
"THE HEART OF THE CARBIC LIGHT"

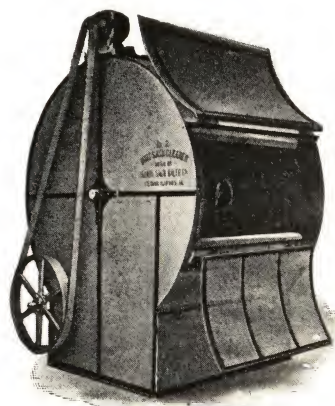
Carbic cakes are the most economical, reliable and time saving means of producing powerful light for portable uses.



These solid, compact "bricks" slip quickly and easily into the light and burn long and efficiently. No fuss, no muss, no waste.



SACK CLEANERS AND BALERS



The Unit Sack Cleaner—The use of this machine which we furnish in a range of sizes the smallest of which cleans 150 sacks per hour and the largest which cleans 1200 sacks per hour will result in a high, net saving to you each year.

We have used one of these machines in our own warehouse for several seasons and find that we salvage from $\frac{1}{2}$ to 1 lb. of cement for each sack cleaned and our rejection of sacks at the mill is cut down about 90%; that the labor required to clean sacks is minimized; that the sorting and baling of sacks is greatly facilitated and that the power consumed by the machine and the maintenance of the machine are practically negligible.



The Handy Sack Baler—This simple, little machine will save money for you if you use as many as 100 sacks of cement a day. It simply folds the empty sacks around the center rod, keeping them smooth and compressed in a tight bundle until they are wired.

WOVEN WIRE SCREEN



3/8" Space No. 9 wire



6 mesh No. 16 wire



3 mesh No. 16 wire
or 1/4" space



3/16 space No. 12
wire or 3-1/2 mesh



1/4" space No 11 wire

We furnish screens any width up to 8 feet wide Nos. 0 to 20 gauge wire and in heavy rods 5/16", 3/8", 7/16", 1/2" etc., in plain steel wire.

Nos. 4 to 20 gauge in galvanized wire.

No. 0 to 20 gauge in spring steel (not as firm or close mesh as can be made in plain or galvanized wire, however).

When asking for price, state width, length, and size and kind of wire.

To determine mesh, figure from center to center of wire.

To determine opening, measure clear space between wires.

SCAFFOLD BRACKETS AND TRESTLES

CARPENTERS BRACKET



Hook directly around studding. No Bolts, no Screws. Judge for yourself the safety of this bracket. Every one tested to one ton.

Made in four sizes— $2\frac{1}{2}$ - 3 - $3\frac{1}{2}$ - 4 ft. long.

Fold compactly for cartage or storage.



Carpenters Bracket Folded



Over

LADDER JACKS

The lightest, safest, handiest Ladder Jack on the market. Weight taken on three rungs. You can't put them on wrong.

You can often use Ladder Jacks where a scaffold would cost a lot of money.



Under



STUCCO BRACKET

Just drive four 10 d nails into a stud and go ahead. Tested out for a ton. Save money erecting scaffold, and work closer to the wall. Save dash. Folds like Carpenters bracket.



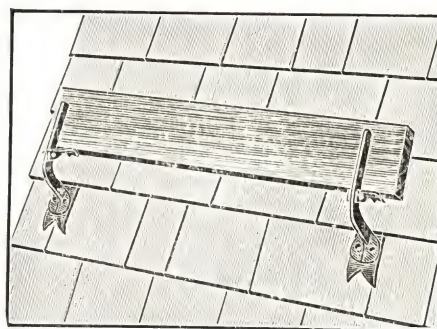
ADJUSTABLE TRESTLES

For carpenters, bricklayers, mill wrights, plasterers, etc. Adjustable in 3 in. heights. Made in six sizes from 16 inches to 10 feet high. Use any 2" timber for ledger.

ASPHALT SHINGLERS

Two nails can be used when thought necessary.

Not necessary to raise shingle to remove.



"SNAPPING TURTLE" SHINGLER

For wood shingles. No nails necessary. Made of forged steel.

No roof too steep.

BAR BENDERS AND SHEARS



A view of our Giant Hand Bender. Note: When bar is placed in position for bending, lever must be on opposite side of circular gauge.

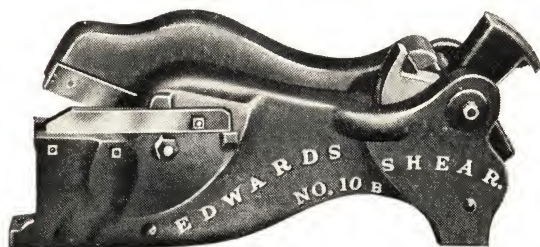
Giant Hand Bender

This bender was placed on the market for the purpose of meeting the requirements of contractors who do not have a large tonnage of steel to bend, and yet must have a bender that bends all sizes of bars.

Our Giant hand machine bends all sizes, same as our power bender, with the exception that the output is not as great.

This bender is equipped with an improved circular gauge, also has attachment for measuring from bend to bend. This assures uniform bending; also eliminates marking of bars.

These gauges are only excelled on our power bender, and will not be found on any other bender outside of the Kardong benders.



Edwards No. 10 Shear

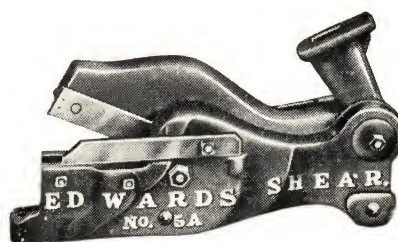
**Cuts Mild Steel 4 x $\frac{3}{4}$ inches and 1 inch round.
Knives 7 inches long; weight 440 lbs.**

The general construction and action of the No. 10 Shear is by far the simplest of any similar product of like weight and shearing capacity that has ever been on the market.

The top jaw is moved by a small diameter pinion on which are cast three lever sockets standing at different positions. A complete revolution of the pinion closes the jaw. This type of construction is unequaled for its enormous power and simplicity. By revolving the pinion with the handle the jaw can be closed sufficiently to cut the width of stock required. The above illustration shows the jaws just beginning to close.

Every machine is tested when set up by cutting 5 x $\frac{3}{4}$ inch steel bars. The handle is seven feet long and is upset at the socket end. It is sold with the shear as an extra permitting the purchaser to either have it furnished or make one himself.

This shear is a powerful, compact, well built tool with the reputation of thirty-two years of production and satisfactory results back of it. It is without an equal for a hand power shear and will last a life time.



Edwards No. 5 Shear

**Cuts Mild Steel 4 x $\frac{1}{2}$ inches and $\frac{3}{4}$ inch round.
Knives 7 inches long; weight 200 lbs.**

The No. 5 Shear is on the same principle as the No. 10, the difference being in the type of pinion, weight and size.

The Shear is to be fastened to the floor only at one end with a bolt or Skein-screw permitting the other end to be swung around to any position for cutting.

It sits low on the floor consequently the operator has great power with the lever by standing above the shear. The low construction also makes it unnecessary to hold up the outer end of long bars when cutting.

Great advantage is found in the No. 5 and No. 10 because they are open end shears which makes it very handy to get the material in position to cut. It can do work that positively cannot be done on a closed end shear. It is recommended to cut plow steel $\frac{1}{4}$ x $6\frac{1}{2}$ inches.

The Edwards No. 5 has been on the market for thirty-two years and has proved itself to be the best and cheapest shear made. At the price they sell for, no Iron Worker, Blacksmith, or Wagon Maker can afford to be without one. It is one of the handiest tools in a shop. Handle is furnished as an extra.

Wheelbarrows and Concrete Carts



TUBULAR STEEL BARROW
FOR MORTAR AND WET CONCRETE

Length over all, 64 inches; width over all, 26 inches; height over all, 29 inches; tray length, 35 inches; tray width, 25 inches; tray depth at wheel end, 17 inches; tray depth at handles, 7½ inches; gauge of steel, No. 16; wheel diameter, 16 inches; tire 1¾x¾ inches; steel axle, ⅝ inch; capacity in cubic feet, 4; weight in pounds, 82.

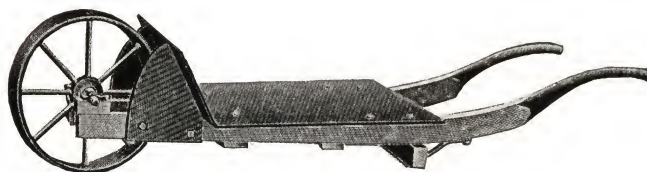
Do not overlook the fact that the above barrows have a steel rod rolled in the tray.



STANDARD CONCRETE BARROW

Just the thing for contractors, cement and concrete workers. It carries a man's load. Tray made of No. 15 steel, measures on top, 28x36 inches, on bottom, 20x21 inches. Depth at wheel, 18½ inches, at handle end, 9 inches, has heavy rod rolled in edge. Handles are heavy, of selected hardwood. Legs and braces of angle steel. Heavy steel wheel, 16 inches in diameter, running on a ⅝-inch steel axle through lugs bolted on under side of handle. Weight, per dozen, 900 pounds.

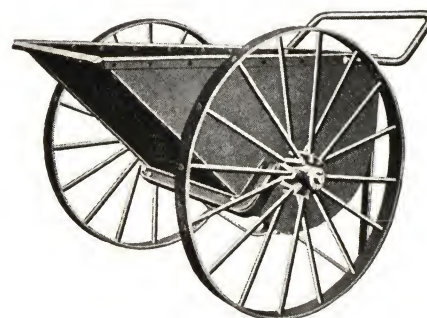
Do not overlook the fact that the above barrows have a steel rod rolled in the edge of the tray. Also notice the steel shoes. Capacity 4 cu. ft.



STEEL BOTTOM STONE BARROW

Tray made of one piece of steel (¼-inch thick) 26 inches wide, 27 inches long, 9 inches high in front. Weight, 125 pounds each.

In other respects this barrow is the same as stone barrow shown below.



CONCRETE CART

For the contractor, builder and concrete worker who discriminates in favor of first class labor saving equipment.

This Concrete Cart has a carrying capacity of seven cubic feet, dry material; six cubic feet sloppy concrete. It is fitted with a round bottom bowl, hung so that it will dump easily.

Size of bowl, 23½ inches wide over all; 39¼ inches long at top; 19½ inches deep. Bowl is made of 14 gauge steel reinforced with angle iron entirely around top edge, forged corners.

Width of cart over all 36¾ inches; height, 32 inches; wheels, 30 inches diameter, 2-inch tread. Spokes are staggered about 2 inches. Self-oiling hub, dropped axle 1¼ inches square. Weight, complete, 190 pounds.

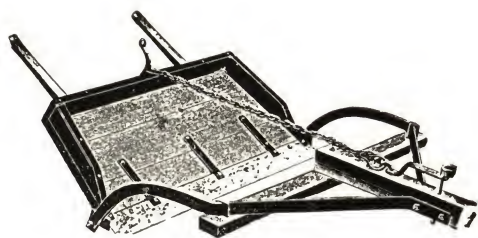


WOODEN BOTTOM STONE BARROW

Made for heavy work. Bottom and front of 1½-inch hardwood, dressed and well seasoned. Barrows painted brown. Weight, 70 lbs. each.

Size of bottom, 28 inches wide, 27 inches long, and 11 inches high in front. Handles 2 x 3 inches, dressed, made of oak, rock elm or hickory.

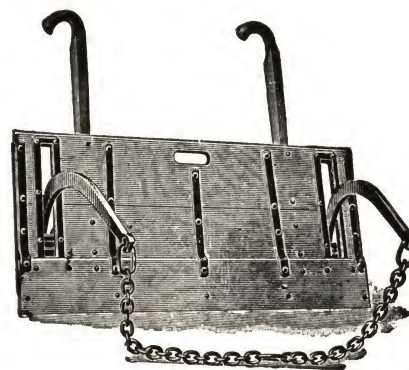
Utah Tongue and Doan Scrapers



THE UTAH TONGUE SCRAPER

For making or leveling roads, cutting or cleaning ditches, etc. Made of well seasoned hardwood. Substantially ironed and securely bolted. Steel blade for cutting edge is of *extra hard quality*. Heavy steel draw bars; oak tongue and cross piece. *Extra heavy malleable shoes*. We furnish a malleable draw pin and wrench combined. Made in three sizes.

- No. 1—48 inches wide; weight, 135 pounds.
- No. 2—42 inches wide; weight, 130 pounds.
- No. 3—36 inches wide; weight, 120 pounds.



THE DOAN SCRAPER

The Doan Scraper is made of seasoned hardwood, well ironed and bolted. The bit is of extra hard steel ground to a cutting edge. The hounds are of $1\frac{3}{4}$ x $\frac{5}{8}$ wrought steel, with $\frac{3}{8}$ cable chain.

To back-fill a trench, a rope or chain about 20 feet long is fastened to the cable chain on the scraper, and the team is hitched to the end of the rope. The team works on one side of the trench, and the man holding the scraper works on the opposite side. Operating in this manner, one Doan Scraper will do as much back-filling in a given length of time, as 50 shovelers.

Width, 48 inches; weight, 75 pounds.

Wheelbarrows and Concrete Carts



NARROW CONCRETE BARROW

Just the thing for contractors, cement and concrete workers. It carries a man's load. Tray made of No. 15 steel, measures on top 24 x 38 inches, on bottom, 18 x 21 inches. Depth at wheel, 19 in. at handle end, 9 in., has heavy rod rolled in edge. Handles are heavy, of selected hardwood. Legs and braces are angle steel. Heavy steel wheel, 16 inches in diameter, running on a $\frac{5}{8}$ inch steel axle through lugs bolted on under side of handle. Weight per dozen, 900 pounds.

Do not overlook the fact that the above barrows have a steel rod rolled in the edge of the tray. Also notice the steel shoe. Capacity, 4 cubic feet.



MORTAR BARROW

Angle steel legs and braces. An excellent barrow for mortar and wet concrete. Tray measures 26x34 inches and is made of No. 16 steel reinforced at corners and strengthened at top by being rolled over by a 5-16-inch steel rod. Heavy steel wheel 16 inches in diameter, $1\frac{3}{4}$ x5-16-inch tire, running on a $\frac{5}{8}$ -inch steel axle firmly held in heavy lugs. Capacity $3\frac{1}{2}$ cubic feet. Weight, per dozen, 875 pounds.

Slip, Wheel and Fresno Scrapers



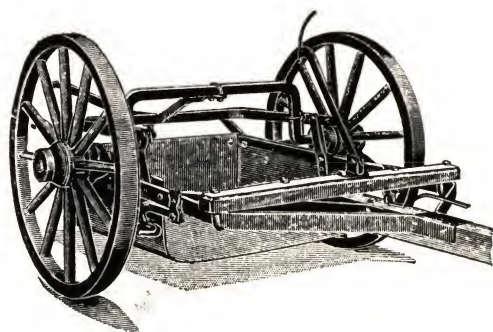
SLIP SCRAPER

Our Slip scraper is pressed from a *heavy plate of hardened steel of the toughest quality*. It is shaped throughout on *scientific principles* which utilize the great strength of this steel to the best advantage, and make the scraper most efficient for the hard work for which it is built. Made in Three sizes.

Number 1—This is the *largest size*. It is adapted for heavy grading and for long hauls. The dimensions below are approximate: From top of back to cutting edge, 33½ inches; width 32 inches; depth, 11½ inches. Capacity, 7 cubic feet. Weight 102 pounds.

Number 2—*This is the size best adapted for general use*. We recommend it for all railroad, township and farm work. It is easily handled by one man and team. Dimensions: From top of back to cutting edge, 31½ inches; width, 29 inches; depth, 11½ inches. Capacity, 5 cubic feet. Weight, 94 pounds.

Number 3—*This is the one horse scraper*... It is adapted for use on high banks and in ditches. It can be used wherever a plow will work. Dimensions: From top of back to cutting edge, 32 inches; width, 25 inches; depth, 10¾ inches. Capacity, 3 cubic feet. Weight, 80 pounds.



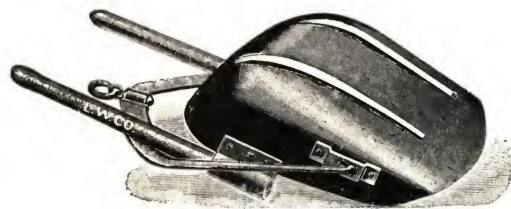
WHEEL SCRAPER

No. 1—Capacity, 10 cu. ft., box made of No. 9 gauge steel; wood hub wheels, 36 inches high; tire, 3 x ¼ inch; weight, 490 pounds, axles, 1½ inches square steel.

No. 2—Capacity, 12 cubic feet; box made of No. 8 gauge steel; wood hub wheels, 40 inches high; steel tire, 3x5-16 inch; weight, 600 pounds; with apron, 650 pounds; axles, 1½ inches square steel.

No. 2½—Capacity, 14 cubic feet; box made of No. 8 gauge steel; wood hub wheels, 42 inches high; steel tire, 3x5-16 inch, weight, 625 pounds; with apron, 675 pounds; axles, 1¾ inches square steel.

No. 3—Capacity, 17 cubic feet, box made of No. 7 gauge steel; wood hub wheels 45 inches high; steel tire, 3x¾ inch; weight, 760 pounds; with apron, 810 pounds; axles, 1¾ inches square steel.



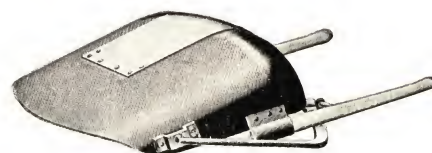
SLIP SCRAPER, With Runners

We always ship with runners unless otherwise instructed.

Runners are obviously of advantage in several ways. They save wear and tear on the bottom, strengthen the bottom and serve to make the scraper draw easily. We fit the runners closely to the bottom and fasten them on to stay with counter-sunk rivets. We guarantee them not to get loose or to come off. See cut above.

Runners ½ x 1½ steel, weight 8 pounds.

The *durability* of a scraper when fitted with extra steel bottom plate is *greatly increased*. The *extra plate* on the bottom is 3-16 inches thick, 21 inches long, 13 inches wide, and weighs 8 pounds. See cut below.



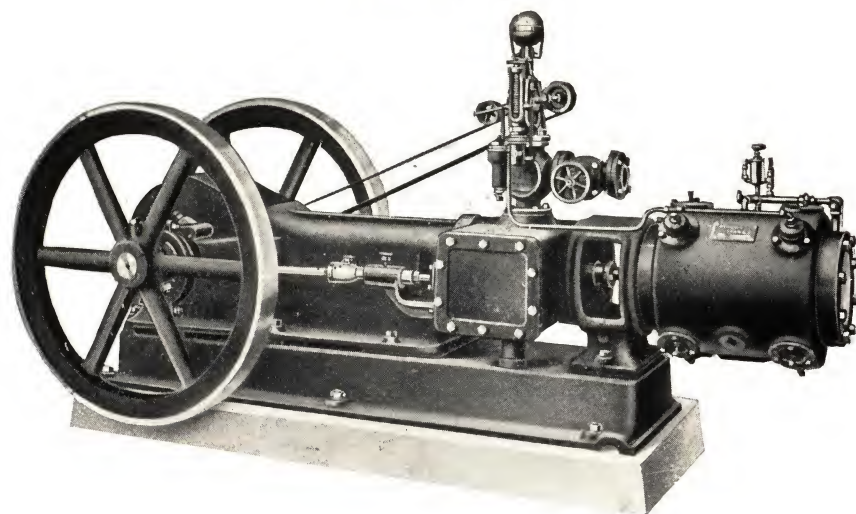
FRESNO SCRAPER

An implement unsurpassed for making Irrigation Ditches, Leveling Land, Building Levees, etc.

By the use of the *best grades of material*, and careful attention given to every detail of its manufacture, this Scraper is *practically indestructible*. The parts most exposed to wear are easily and cheaply renewed. These are the *hard steel* bottom plate, the front of which is the cutting edge, and the shoes on the angle runners and the back of the body. Its carrying capacity is not equaled by any similar machine, and this, together with its great strength and assured long life, makes it the most economical tool a contractor can have in his outfit. The load may be carried any distance, and deposited either in bulk or distributed evenly, as the nature of the work may require. These scrapers are made after plans suggested by operators who have had practical and extensive experience with them, and have embodied in their make-up the very latest and most advanced ideas, and can not fail to meet with approval.

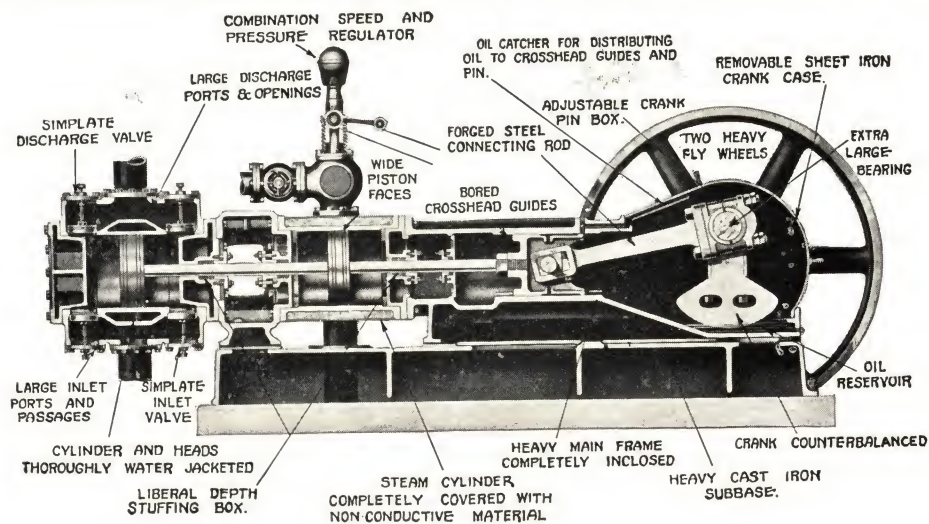
Single Steam Driven, Self - Oiling Air Compressors

Class N-SS



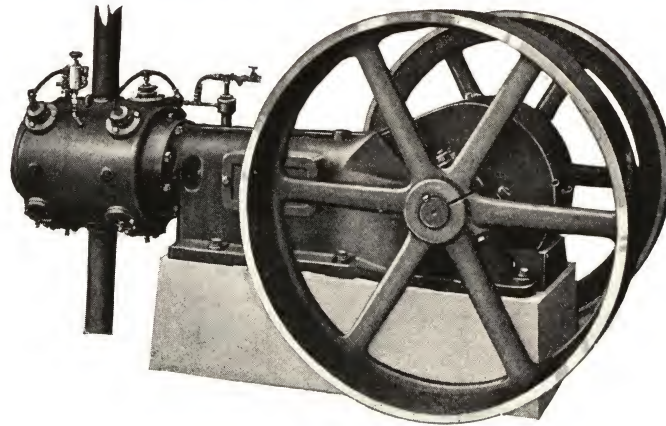
Cylinder Diameter, Inches			Capacity Cubic Feet Free Air Per Minute Piston Displacement	R. P. M.	I H. P. in Steam Cylinder	Fly Wheels		Air Pressure Suited for	Pipe Connections, Inches				
Steam	Air	Stroke				Diameter, Inches	Weight of Two, Pounds		Steam Supply	Steam Exhaust	Air Inlet	Air Discharge	Water Jacket Supply
6	6	6	69	350	9-11	36	400	80-125	1 1/4	1 1/2	2	2	1/2
6	7 1/2	6	107	350	13-17	36	400	50-100	1 1/4	1 1/2	2 1/2	2	1/2
8	8	8	139	300	21-26	42	800	80-125	2	2 1/2	3	3	1/2
8	9	8	176	300	24-30	42	800	70-100	2	2 1/2	3	3	3/4
8	10	8	218	300	24-31	42	800	40-70	2	2 1/2	3	3	3/4
10	10	10	250	275	39-48	48	1200	80-125	2 1/2	3	4 1/2	4 1/2	3/4
10	12	10	360	275	45-62	48	1200	50-100	2 1/2	3	4 1/2	4 1/2	3/4
13 1/2	12	12	392	250	63-78	52	1600	80-125	4	4 1/2	5	5	3/4
13 1/2	14	12	534	250	70-94	52	1600	50-100	4	4 1/2	5	5	3/4
15	14	14	549	220	90-115	60	2800	80-125	4 1/2	5	6	6	3/4
15	17	14	809	220	94-132	60	2800	40-80	4 1/2	5	6	6	3/4

Note:—All sizes have plain slide steam valves. Valves on 12 and 14 inch strokes are double ported and balanced.

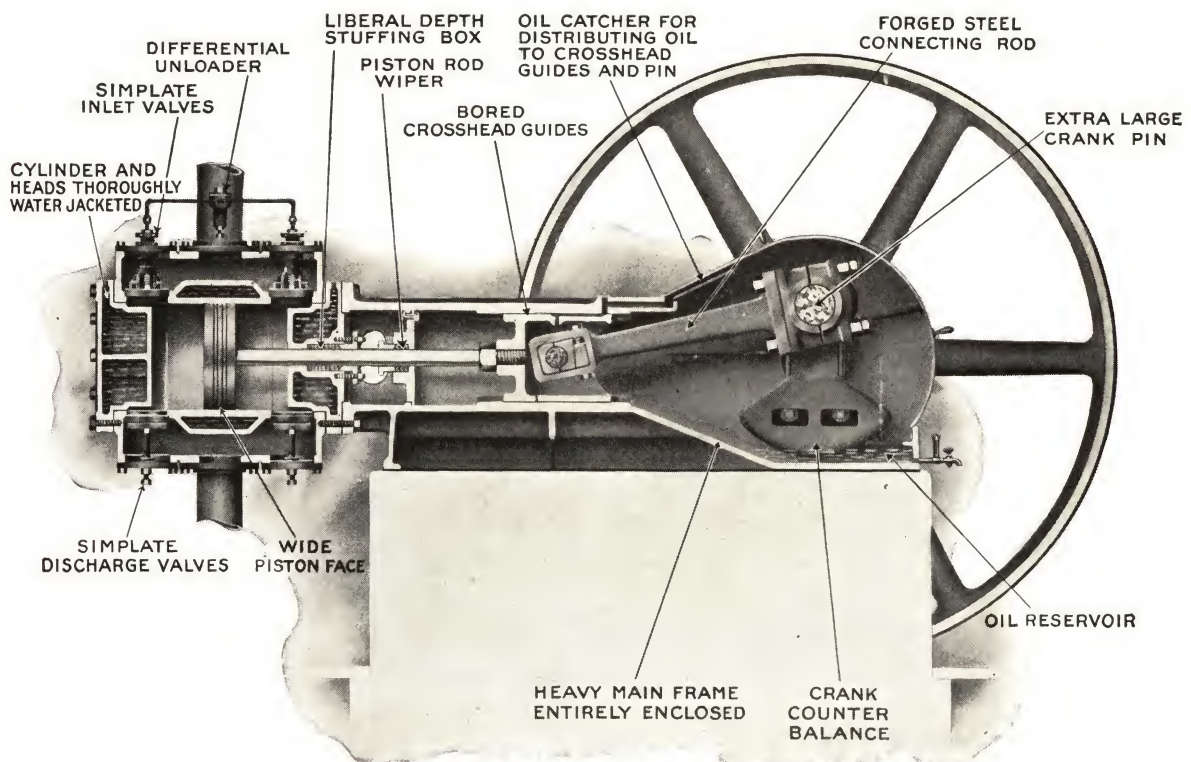


Chicago Pneumatic Compressors

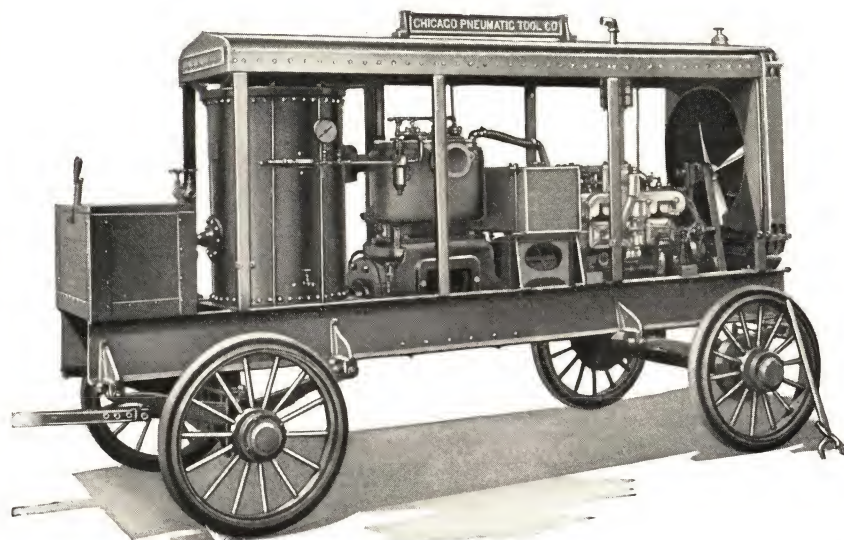
Single Belt-Driven, Self-Oiling Compressors - Class N-S B



Cylinder, Inches		Cap. Cubic Feet Free Air per Minute Piston Displacement	R. P. M.	H.P. Required	Air Pressure Suited for	Pipe Connections, Inches			Beltwheel			Flywheel	
Diam.	Stroke					Air Inlet Pipe	Air Discharge Pipe	Water Jacket Supply Pipe	Diam. Inches	Face Inches	Weight Pounds	Diam. Inches	Weight Pounds
6	6	69	350	10 1/4 - 10 3/4	100-125	2	2	1 1/2	36	5 1/4	200	36	200
7 1/2	6	107	350	13 1/2 - 17 1/2	50-100	2 1/2	2 1/2	1 1/2	36	5 1/4	200	36	200
8	8	139	300	21 1/2 - 22 1/2	100-125	3	3	1 1/2	46	7 1/4	400	42	400
9	8	176	300	24 - 26	80-100	3	3	1 1/2	46	7 1/4	400	42	400
10	8	218	300	27 - 29 1/2	50-70	3	3	1 1/2	46	7 1/4	400	42	400
10	10	250	275	43 - 47	100-125	4 1/2	4 1/2	1 1/2	50	11 1/2	800	48	600
12	10	360	275	56 - 60	80-100	4 1/2	4 1/2	1 1/2	50	11 1/2	800	48	600
12	12	392	250	67 - 74	100-125	5	5	1 1/2	60	12 1/2	1350	52	800
14	12	534	250	75 - 92	80-100	5	5	1 1/2	60	12 1/2	1350	52	800
14	14	587	235	93 - 97	100-125	6	6	1 1/2	78	14 1/2	1850	60	1400
17	14	864	235	110 - 127	50-80	6	6	1 1/2	78	14 1/2	1850	60	1400



Portable Gasoline Engine Driven Compressors

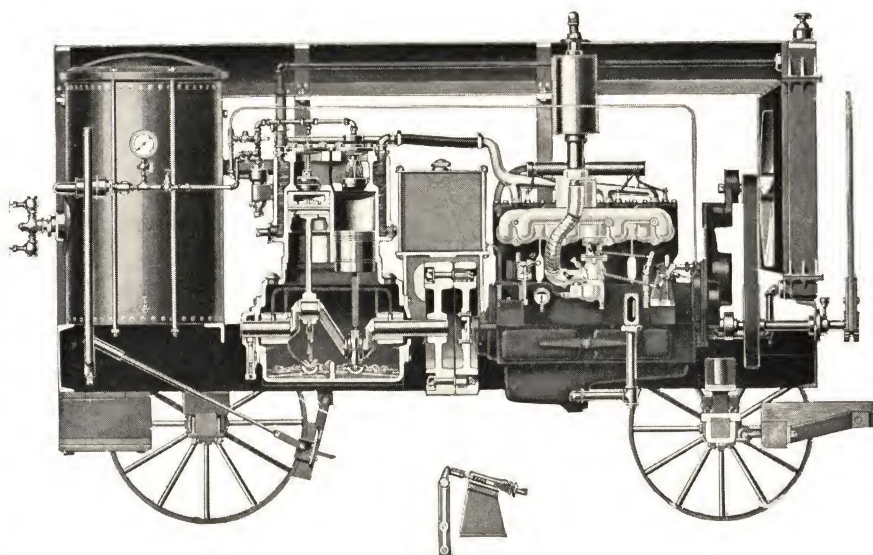


CLASS P DGL

A sturdy and dependable portable air power unit, gasoline engine driven, in which large capacity is effectively combined with light weight. This machine enables the compressed air user to bring his power unit right to the job, when and where it is needed, thus eliminating the wastes due to long, leaky pipe lines. It is always ready to start. The combination of large capacity and light weight is made possible by the use of a duplex vertical air compressor, equipped with Simplate flat-disc air valves, and of a high-powered four-cylinder gasoline engine of the tractor type.

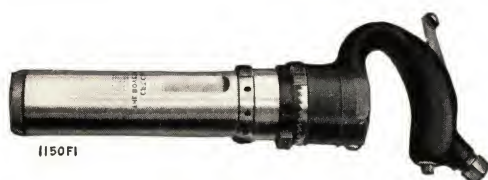
Ideal operating economy under variable loads is secured by the use of a new and exclusive device, the Auto-pneumatic Throttle. This device, operating in conjunction with the Differential Unloader, permits the engine to operate very slowly when there is no demand for air, or when the compressor is unloaded, and also allows the engine to attain full speed before taking up the load, when the demand for air is resumed. An adequate cooling system cares for both gasoline engine and air compressor.

Air Cylinders Duplex Inches		Piston Dis- placement Cu. ft. Free Air per Minute	R. P. M.		H. P. De- veloped at 100 Pounds Pressure	Maximum Air Pressure Lbs. per sq. Inch	Type of Drive	Shipping Wt. Portable Type Lbs.	Net wt. Semi- Portable Type Lbs.
Diam.	Stroke		Engine	Compressor					
6 1/4	6	128	600	600	19	150	Flex. Couplg.	4900	3800
7	6	160	600	600	23	150	Flex. Couplg.	5800	4700
8	6	210	600	600	33	125	Fric. Clutch	6600	5400



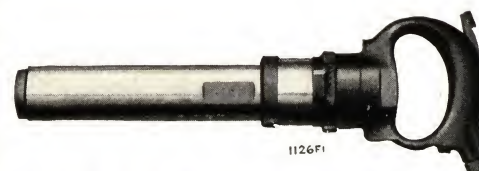
An air receiver of ample capacity is mounted upon the truck and a 20-gallon gasoline tank is suspended from the canopy top. The equipment includes all necessary piping, a safety valve, pressure gauge, drain valve, service valve, tool box, wrenches, a tongue with a neck yoke and single and double-trees, ratchet starting lever and hand brake. The outfit is mounted upon a truck covered by a steel canopy top. Steel doors completely enclose it — no other protection from the elements is necessary. It can be mounted on a solid rubber-tired trailer when desired. It can also be furnished in skid-mounted, semi-portable type, with or without top and sides.

Boyer Long Stroke - Riveting Hammers



No. 80 Standard

The Boyer Long Stroke Riveting Hammer is divided into three distinct members, cylinder, handle and valve. In each of these members there is a moving part subject to wear, but in varying degrees. It is frequently possible to replace but one of these members and obtain a comparatively new hammer as a result.



No. 80 Special with closed handle.

The handles are interchangeable on all sizes of riveting hammers of a type, so that a worn-out handle or cylinder does not mean the passing of a complete tool, but of the worn member only.

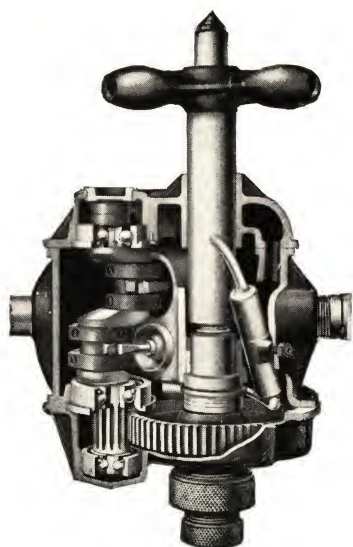
All parts are made interchangeable by jigs, fixtures and templates.

Any standard hammer may also be equipped with a closed handle and inside trigger. This type is preferred by some workmen.

For driving rivets in close quarters, the No. 50 hammer with the inverted handle is recommended. It will drive $\frac{7}{8}$ -inch rivets in structural and $\frac{3}{4}$ -inch rivets in fire-box and boiler work. Nos. 60, 80 and 90 hammers can also be so fitted.

Size no.	Diam. Piston Inches	Length Stroke Inches	Capacity (Rivets) Inches	Blows per Min.	Free Air per Min. Cu. Ft.	Size Hose Conn. Inches	Length Inches		Net Weight Pounds	Shipping Weight Pounds
							With Open or Closed Handle	With Inverted Handle		
40	1-1/16	4	$\frac{5}{8}$	1524	30	$\frac{3}{8}$	14 $\frac{3}{4}$	-----	15 $\frac{1}{2}$	19 $\frac{1}{2}$
50	1-1/16	5	$\frac{3}{4}$	1400	32	$\frac{3}{8}$	16	13 $\frac{3}{4}$	20	24
60	1-1/16	6	$\frac{7}{8}$	1150	32	$\frac{3}{8}$	17 $\frac{5}{8}$	15 $\frac{1}{4}$	23	29
80	1-1/16	8	1 $\frac{1}{8}$	1050	34	$\frac{3}{8}$	19 $\frac{1}{2}$	17 $\frac{1}{4}$	25	32
90	1-1/16	9	1 $\frac{1}{4}$	900	35	$\frac{3}{8}$	20 $\frac{5}{8}$	18 $\frac{1}{4}$	26	33
80-X	1-3/16	8	1 $\frac{3}{8}$	850	36	$\frac{3}{8}$	21	-----	24 $\frac{1}{2}$	32
11	1-3/16	11	1 $\frac{1}{2}$	650	36	$\frac{3}{8}$	23 $\frac{3}{4}$	-----	31 $\frac{1}{2}$	45

Little Giant Air Drills



Little Giant Air Drills are rightly called the world's standard pneumatic drills. Years of experiment and development have brought their design and construction to a standardized basis which is departed from only in minor details to specially adapt them to specific applications as in drilling, reaming, tapping, wood-boring or grinding. The sizes range from the No. 10 (Midget) Types, with a drilling capacity of $\frac{1}{4}$ inch in steel, to the heavy duty drills of the Class D and E Series that drill, ream and tap up to three inches and roll four-inch flues. In between are plain spur-gear, internal, and compound-gear, reversible and non-reversible types.



Handle-Reversing Little Giant Close-Quarters Air Drills

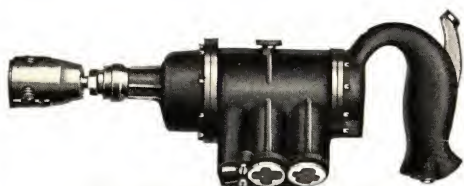
Anyone who has been forced to invert a close-quarters air drill to reverse the bit or reamer can appreciate the Nos. 81-R and 91-R Little Giant Close-Quarters Air Drills built with the reversing control right in the handle. These close-quarters types are also supplied in non-reversible machines.

All materials used in the manufacture of their component parts are selected with care and only after exhaustive metallurgical tests have proven them fit for their particular function. In this manner a high degree of dependability is assured the user which implies low maintenance expense. Their design takes advantage of every mechanical principle involved to promote long wear and operating economy.

The motors of Little Giant Air Drills are of the balanced-piston type, that is, two pairs of two pistons each are connected to opposite wrists of a double-throw crank-shaft providing smooth, well-balanced operation. The leak-proof valves also, are of the balanced piston type, actuated by eccentrics on the crank-shaft. They move but one-twentieth of their length consequently no appreciable wear is encountered and but little power is required to operate them.

The crank-shaft, specially treated and tempered to give tensile strength in the throws and hardness at wearing points, turns on three ball bearings. The extra, or third bearing, gives proper shaft support on each side of the drive pinion, (see sectional view) and eliminates vibration which minimizes the number of broken crank-shafts. The ball bearings used are complete with inner and outer races and are of ample size to carry the load.

Little Giant Air Drills (Continued)



No. 10F Little Giant Air Drill

This is the smallest air drill in the Little Giant list. It is convenient for work of a limited nature and is easy to use. Capacity: $\frac{1}{4}$ -inch in steel; $\frac{1}{2}$ -inch in wood.

Power reduction is accomplished through gears of the stub-tooth type, universally approved and used by the automotive industry. Several years' experience with these gears, which are stubby and thick at the base, has proved their effectiveness in reducing gear failure while under severe service.

A brief examination of the accompanying sectioned illustration will show that drill pressure is not distributed to the housing, but the entire thrust is transmitted direct to the feed-sleeve and screw—an important item in itself. A thrust-bearing immediately above the main-gear reduces thrust-friction. A three-unit housing is employed to cut down replacement costs in event of breakage to either the cylinder, bonnet, or gear-housing. Spindles are machined to receive Morse Taper Shanks unless otherwise specified or different chucks are desired. One handle contains the throttle-valve and air-hose connection by which the machine is regulated and controlled.

All moving parts are thoroughly lubricated by the splash system. A new feature of Little Giant Air Drill lubrication is the Vent-Tube—a device for retaining the oil within the crank-case. This feature alone produces a substantial saving on lubrication and attendance costs.

CP Rock Drills

Mounted Drills



CP-5 Drifter on G-41 Column

The drills are clean-cut without knobs or projections, which, coupled with the fact that they sit low in their shells, facilitates the changing of steel without disturbing alignment. The CP-5 is 35 to 60 pounds lighter than other heavy mounted drifters.



CP-8M Mounted

Hand Hammer Drills

Specifications—Hand Hammer Drills

TYPE	CP-8	CP-8W	CP-8A	CP-10	CP-10W
Diameter of Cylinder.....inches	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2
Length of Stroke.....inches	2 1/8	2 1/8	2 1/8	2 5/8	2 5/8
Net Weight .....pounds	42	45	40	55	58
Length over all (without steel retainer) .....inches	19	19	19	21 1/4	21 1/4
Size of Air Hose .....inches	3/4	3/4	3/4	3/4	3/4
Size of Water Hose .....inches	1/2	1/2	3/8	1	1 1/2
Size of Hollow Hexagon Drill Steel .....inches	7/8	7/8	* 7/8	† 1	† 1
Size of Steel Shank .....inches	7/8 x 3 1/4	7/8 x 3 1/4	7/8 x 3 1/4	1 x 4 1/4	1 x 4 1/4
Economical Depth to which holes can be drilled ..feet	10-12	10-12	6-8	14-16	14-16

*For auger work, as in iron ore, 1 1/2" solid, twisted, auger steel, diamond section, is used. Shank is standard 7/8 x 3 1/4".
 † 7/8" hexagon, hollow steel also used quite generally on this drill.

The CP-8 and CP-10 are as heavy as competitive machines but will out-drill machines of equal weight.

The entire line of CP Rock Drills are cushioned on both front and rear end. This reduces internal vibration and is an important factor in maintenance or repair costs. The superior drilling speed of these machines is due to the fact that they have quick-acting valves and strike more blows per minute than any other drill on the market. This together with 4-pawl rotation and proper distribution of weight, gives a light, fast-hitting, strong rotating drill, free from excessive vibration and easy to handle.

The accompanying cuts, together with tabulated specifications given below, indicate the scope of this line including the ordinary dry drill, the wet drill and the mounted drifter, and indicate the services for which they are intended.



CP-8W Sinker Drill Wet



CP-8A Auger Drill

Specifications—Mounted Drills

TYPE	CP-8M	CP-5
Diameter of Cylinder .....inches	2 1/2	3
Length of Stroke .....inches	2 1/8	2 3/8
Net Weight .....pounds	85	118
Length over all (with standard feed) .....inches	46	46
Length of Feed (change of steel) .....inches	24	24
Size of Air Hose .....inches	3/4	1
Size of Water Hose .....inches	1/2	1/2
Standard Hollow Drill Steel (shanked) .....inches	7/8 hex.	† 1 1/4 round
Size of Steel Shank .....inches	7/8 x 3 1/4	1 1/4 x 3-13/16
Standard Hollow Hexagon Drill Steel for Anvil Block Chuck .....inches	7/8	1
Size of Suitable Column .....inches	G-41-(3")	G-41-(3")
Size of Suitable Tripod .....inches	*G-11 (287 lb.)	G-11 (287 lb)
Economical Depth to which holes can be drilled.....feet	6-9	8-12

*Also furnished without weights for CP-8M Mounted Sinker. Weight of tripod only—104 lbs.
 † 1" and 1 1/8" round hollow steel also used.

HOTCHKISS STEEL FORMS FOR CONCRETE ROAD WORK

Road Rails, Curb and Gutter Forms, Sidewalk Forms



Hotchkiss Super Road Rail in place for
Road Building

The Hotchkiss line is the most complete in designs, variety and quality in existence. We advertise to fit all conditions under all circumstances and our variety covers all of these points—any method of construction, any special specifications carefully and strictly adhered to. We show various illustrations with explanations, and in all the forms that we manufacture quality is the principle element.

The Super Road Rail, as shown in two engravings, is made up in two gauges of steel—Super Light of 10 gauge and Super Heavy of 8 gauge. Both of these types of road forms are made exactly alike except the weight of steel used.

We call your attention to the mechanical construction of the Super rail. 1st—It has 3 staking pockets which makes a substantial support, and between each of these pockets we have intermediate supports, making 5 rigid supports to every 10' section. The rivets used in the top flange of this rail are 5/16. The connecting slide or joint lock, is of heavy steel with a reinforcement of $\frac{1}{4}$ x 2" bar. The saddle plates are for the purpose of keeping in alignment the abutting ends of the rails, also serving as a reinforcement for the end of the rails; and with the saddle plates, the end guides, the joint lock plate, you keep in perfect alignment both vertically and horizontally the abutting rails. It gives this rail three thicknesses of steel as a reinforcement on each end. The staking device is manufactured under our own patent No. 1492325. The only genuine captive wedge holds the rail to a perfect elevation at any point on the stake. This is of great importance. Mechanically the forms are perfect and the quality is first. The first form brought to the proper grade automatically gives the grade of the next section, making the erection of these forms the simplest that can be devised.

We show in the erection of the Super rail the flexibility of these forms in rounding a curve, giving a closer detail to the form.



Showing Flexibility of Super Road Rails

HOTCHKISS STEEL FORMS FOR CURB AND GUTTER WORK



Curb and Gutter Laid rapidly with
Hotchkiss Steel Forms

The illustrations below demonstrate the efficiency of the captive wedge with steel pocket for sidewalk construction. The purpose of the captive wedge is to hold the rail to the correct elevation. The wedge is constructed with hardened plates. The view at right shows enlarged view of captive wedge with rail elevated from the ground, also tongue-and-buckle end connections of abutting rails.



These reproductions of curb and gutter show the perfect alignment. The pleasing jobs are made possible by the Hotchkiss forms used.

In this particular work as shown the forms are removed several times in one day and reset and refilled.

These cuts also show the use of the radius face rail which is a very important recent adjunct to the Hotchkiss steel form line and eliminates facing the curb, as the manipulation of this face rail by slightly tapping the plate, driving the coarser aggregates back, allowing the liquid portion to come to the surface, makes a complete finish.

The Hotchkiss line of sheet metal forms used in concrete construction are still produced by the pioneer manufacturer in this craft. From the time of origination, the line has always lead, and it has always been copied.

As a leader, responsibility for new ideas and high quality has rested with this concern in placing specifications. Please consider that you are sure of securing the experience as to requirements and the knowledge of production.

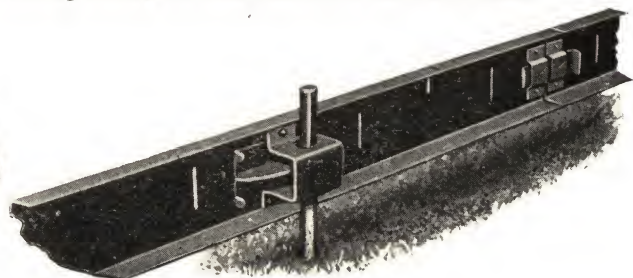
Hotchkiss road forms are accepted as standard by the highway engineers of practically every state in this country, and Pennsylvania has permitted these forms on contracts already using over 50,000 feet this year. Pennsylvania exacts response to the most rigid specifications.

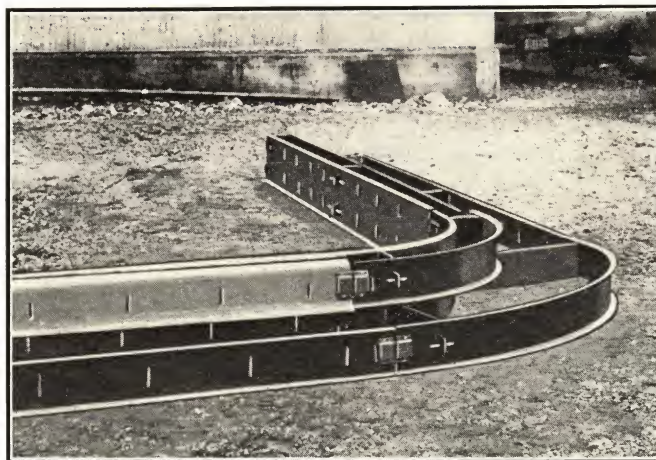
The construction of curb-and-gutter with HOTCHKISS Forms is on the same principle as ordinary curb work. Division plates are ordered of the shape to correspond to the cross section of the finished curb and gutter.

For example, if you have a curb-and-gutter job with curb 12 inches high on the back and 6 inches high on the face, you can use two 6-inch side rails for the back of the curb, and one 6-inch rail for the face of the gutter. The face of the curb is formed by a steel channel set in place on top of the gutter portion of the division plates and locked to the division plates by regular Key-lock lugs and keys.



Fitting Forms for next Section of Curb and Gutter





Intersecting Radius Corner Curb and Gutter Form

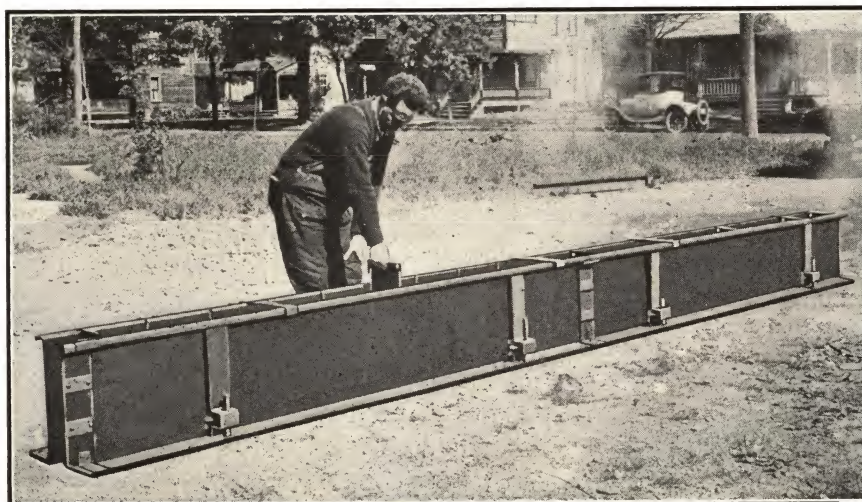
We show in engraving on this page an intersecting radius corner. These same channels are bent to conform to any radius desired. They are locked together in the same manner as curb or curb and gutter forms. They are as quickly assembled as straight forms and as quickly removed. They are provided with face rails locked to the dividing plates; also rigid in construction by channels rolled to conform to the very radius that is necessary. It is one of the most labor saving devices in connection with the Hotchkiss Steel Forms for this class of work.

Another type is shown below of a single 18" curb form used on either side. This is a sturdy substantial curb form and the features of this form gives you two stake pockets provided with captive wedge to hold these rails to grade, the same as our Super road rail, with double reinforced slides with sliplock plates and yokes holding these forms perfectly, as the sliplock plate is pulled.

OUR GUARANTEE

Hotchkiss road forms are always guaranteed against defects of material or workmanship. Defective parts existing in any forms as originally delivered will be replaced free of cost f. o. b. cars at factory if properly established claim is made within sixty days of date of shipment. In order to settle such matters quickly, one of our requirements is that any forms which are claimed to be unsatisfactory shall be returned to the factory within sixty days from the time they were shipped.

The HOTCHKISS reputation for making full and prompt correction or payment in cases of error in shipment or in unsatisfactory forms is well known. Such cases, however, are few and far between for the reason that HOTCHKISS road forms are built right; HOTCHKISS puts out good goods and stands back of them.



Eighteen Inch Curb Form with Stake Pockets and Wedge in Same

HOTCHKISS STEEL FORMS FOR CONCRETE ROAD WORK

Road Rails, Curb and Gutter Forms, Sidewalk Forms

The standard sidewalk forms are the keylock and the sliplock or the combination. They are made in 4, 5 and 6".



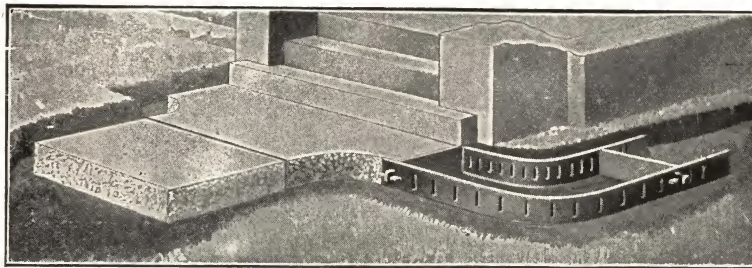
Building Concrete Sidewalks with Hotchkiss Forms

Special forms for use of round stakes for sliplock rails to enable the contractor to use the captive wedge to hold his forms to grade are made in any size required—standard, being 4, 5, and 6". The advantage of the captive wedge is especially efficient as it permits the side form to be brought to the prop-

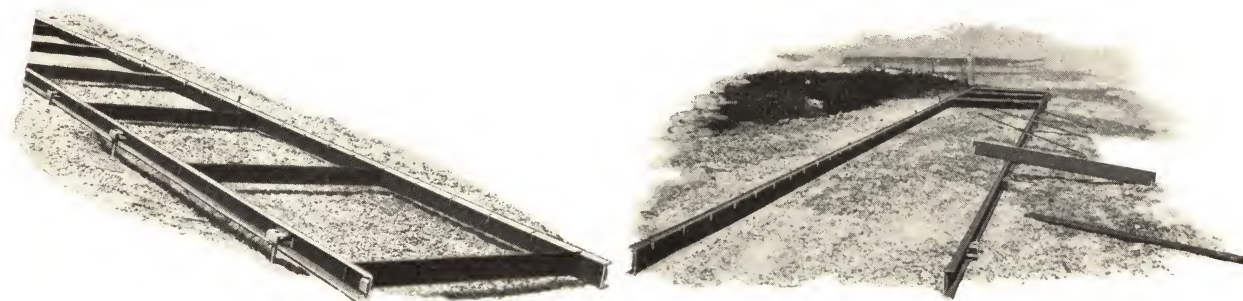
er grade and is held by the captive wedge, obviating the necessity of blocking; the form to secure this grade and the whole alignment is carried on in this manner—setting up the inside form first and using the dividing plate for a gauge to get the outside form and the accustomed drop from inside to outside being the natural slope of the walk. The dividing plates and the subgrade are perfected without the interference from the plates. This type of form is particularly advantageous and employs the sliplock device and can also be made up in a combination so that if contractor desires to use these forms for curb construction he can build up with the keylock style of form.

The Keylock rail is used by locking these forms rigidly to their position by the use of the wedge key in the dividing plates. For small contractors and residential work these forms are probably the most advantageous, for the reason that so many various designs could be carried out with the keylock form to better advantage on small work—radius returns, step approaches and narrow walks to rear entrances, by spring steel flexibles. This class of work in general with this form. The side rails are taken down first and the division plates pulled before the concrete gets hard. The form has served its purpose as a mold and all that is necessary is to protect your work until it becomes hard.

The two views below show the advantage of the sidewalk form of the captive wedge type of construction. The picture on the left shows the form completely assembled ready for plates to be removed for sub-grading. The view at the right shows the sub-grading completed, ready to replace the plates and fill the forms.

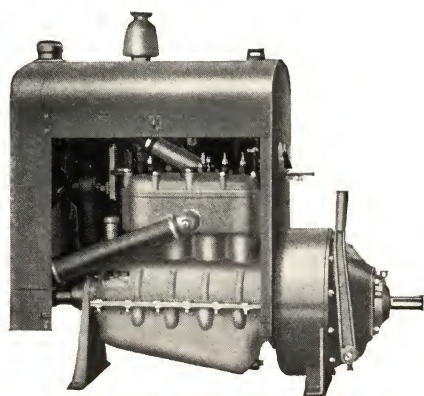


Showing Steel Flexibles to turn the Corner from the Step Approach to the Walk for Back Entrance



LeRoi Gas Engines

The LE ROI Engines will answer the requirements of the most exacting buyer or user. They will give satisfactory service on heavy duty equipment, because they are designed and built to give dependable operation where they are subjected to gruelling work, and often abused and neglected.



LE ROI 4-Cyl. Power Unit

The LE ROI two and four cylinder radiator cooled engines contain all the good points of the highly successful automobile engine. They are light in weight, but heavy enough in their vital

makes them economical power plants.

Consider that we use a high tension magneto and float type carburetor—that the cylinder head is removable, so carbon may be easily removed or valves ground in—that the speed is really controlled by a fly-ball throttling type of steam engine governor—that all wearing parts are flooded with oil by means of the combination system of force feed, by pump as well as splash—that all bearings are of the removable type, and wear on these bearings can be taken up by means of laminated shims, and that the materials used are of the highest grade, with finished workmanship, guaranteeing engines that are as near perfection as can be produced.

Naturally engines constructed as the LE ROI are, cost more money. However, we feel that the great majority of contractors will pay more money if they can be assured of dependable service. We also know by experience, and this is backed up by engines in the field, that the service requirements are less with the LE ROI, than with other makes. This means that in the long run, our type of engine is the cheapest to buy.

SPECIFICATIONS OF TWO CYLINDER

LE ROI POWR-UNIT

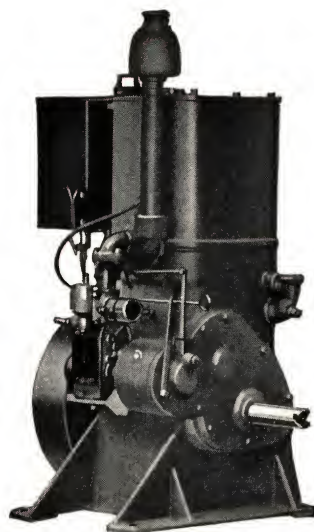
Bore	3 1/8"
Stroke	4 1/2"
Rated Horse Power.....	5-8
Speed of Drive Shaft.....	400 to 600 R. P. M.
Diameter of Crankshaft.....	1 3/4"
Size Crankshaft Bearings.....	1 3/4" x 2 3/4"
Size Conn. Rod Bearings.....	1 3/4" x 2"
Governor.....	Enclosed Flyball Throttling Type of our own make
Magneto.....	High Tension, Guarantees Easy Starting
Carburetor.....	Float Type, Efficient and Economical
Cooling.....	Thermo Syphon with tractor type radiator, also fan and automatically tightened fan belt
Lubrication.....	Combination Force Feed by Pump and Splash
Fuel Consumption.....	1/10 of a Gal. per horse power per hour
Oil Consumption.....	.04 Pints per horse power per hour
Length, Over-All	26 5/8"
Height, Over-All	35 3/8"
Width, Over-All	21 3/8"
Weight Complete	375 Pounds

SPECIFICATIONS OF FOUR CYLINDER

LE ROI POWR-UNIT

Bore	3 1/8"
Stroke	4 1/2"
Rated Horse Power.....	10-15
Speed of Drive Shaft.....	300 R. P. M.
Diameter of Crankshaft.....	1 3/4"
Size Crankshaft Bearings.....	1 3/4" x 2 3/4"
Size Conn. Rod Bearings.....	1 3/4" x 2"
Governor.....	Enclosed Flyball Throttling Type of our own make
Magneto.....	High Tension, Guarantees Easy Starting
Carburetor.....	Float Type, Efficient and Economical
Cooling.....	Thermo Syphon with tractor type radiator and fan
Lubrication.....	Combination Force Feed by Pump and Splash
Fuel Consumption.....	1/10 of a Gal. per horse power per hour
Oil Consumption.....	.04 Pint per horse power per hour
Length, Over-All	38 3/4"
Height, Over-All	35"
Width, Over-All	20"
Weight Complete	650 Pounds

LeRoi Gas Engines (Cont'd)



1-Cylinder Hopper Cooled Engine

The LeRoi one and two cylinder, hopper-cooled engines are a somewhat newer product than the LeRoi radiator cooled types. They are, however, built to the same high standard as are the radiator cooled machines, a great number of the parts being identical.

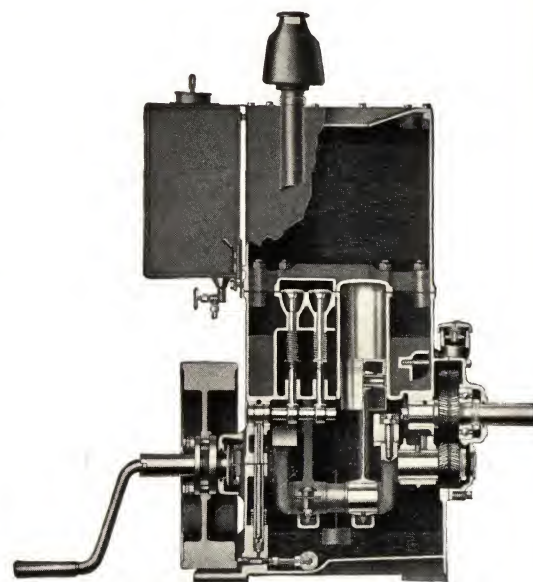
These machines have been designed with the idea in mind of producing a hopper-cooled engine of a higher class than had earlier been known. The satisfactory service which they have been rendering on various types of heavy duty construction equipment indicates that the designers' object has been attained.

Careful design, precise workmanship, and ruthless inspection have worked together in this engine to give perfect balance. These engines can be operated on a floor without bolting down, and we can rightfully claim to have the smoothest operating engine on the market in the sizes listed.

Reducing weight to a minimum and attaining good balance have, of course, resulted in high operating economy. The enclosed, dust and dirt proof design has produced the longest wearing engine of this type thus far developed.

High tension magneto ignition insures a hot spark at all times which produces easy starting and eliminates the expense and annoyance of replacing worn out batteries.

The same make and type of carburetor, as is used on over 90% of the trucks made, is used on



Sectional View of Two Cylinder Hopper Cooled Engine

these engines. Gas is delivered to the carburetor by gravity feed from the fuel tank, thus eliminating the troublesome fuel pump.

A totally enclosed, fly ball, throttling type of governor insures a smooth flow of power at all times.

In common with all the latest automobile engines, we use an oil pump forcing oil under pressure to all main bearings and use the splash system of lubrication for the connecting rod bearings.

All bearings are of the removable type and are the same as used in the best and most expensive engines in America. Wear can be taken up in the connecting rod and crank shaft bearings by means of laminated shims.

The hopper and head are easily removed for the scraping of carbon and the regrinding of valves.

Specifications of One Cylinder Hopper Cooled Engine

Bore	3 1/8 in.
Stroke	4 1/2 in.
Rated H. P.	3-4 H. P.
Speed of Drive Shaft	400-600 R. P. M.
Magneto	High Tension
Carburetor	Float Type
Lubrication	Pump and Splash System
Governor	Flyball—Throttling Type
Cooling	By Evaporation
Fuel Tank Capacity	2 1/2 Gallons
Water Capacity	3 1/2 Gallons
Oil Capacity	3 Quarts
Length	22 in.
Width	19 in.
Height	30 in.
Weight	335 Pounds

Specifications of Two Cylinder Hopper Cooled Engine

Bore	3 1/8 in.
Stroke	4 1/2 in.
Rated H. P.	5-8 H. P.
Speed of Drive Shaft	400-600 R. P. M.
Magneto	High Tension
Carburetor	Float Type
Lubrication	Pump and Splash System
Governor	Flyball—Throttling Type
Cooling	By Evaporation
Fuel Tank Capacity	3 3/4 Gallons
Water Capacity	6 Gallons
Oil Capacity	5 Quarts
Length	26 in.
Width	22 1/2 in.
Height	32 1/2 in.
Weight	395 Pounds

LEROI engines furnished on a great number of the machines in this catalog.

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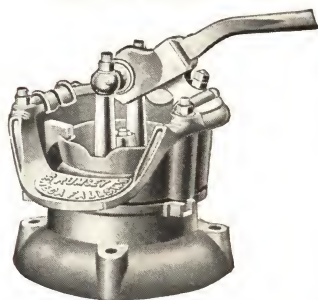
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Rumsey Hand Pumps

Diaphragm Type and Double-Acting Force Type

Fig. 534 Bottom Suction

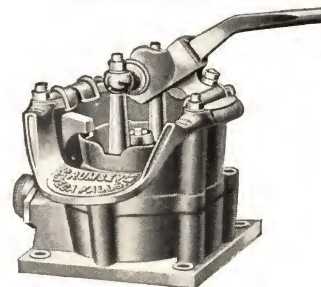


DIAPHRAGM PUMPS

Where it is necessary to raise large quantities of water expeditiously, or to handle water containing mud, sand, grit, gravel, coal or chips, sewage or any liquid that will flow, this type is most effective. Foreign substances will not choke or injure the pump. It is especially adapted for bilge pumping on board ships, barges, dredges and scows and for contractors.

The pump is of very heavy and at the same time simple construction. It is equipped with a diaphragm of high quality rubber, which can be readily replaced when worn out, and has a rubber-faced suction valve, properly weighted, with a brass binder and easily accessible. The wrought iron lever, only partially shown in the cut, is re-

Fig. 535 Side Suction



versible and can be operated horizontally or vertically from either side or the back of the pump. Suction is regularly threaded for iron pipe.

Fig. 534 is made with vertical suction for pipe. For use with a female hose coupling of standard pipe thread, a pipe nipple should be used.

Fig. 535 has side suction, male thread for pipe or hose.

Fig. 275, 3 x 5



Pumps can be furnished to order with short power arm instead of hand lever and with jack and wooden sub-base ready to receive engine for \$60.00 extra list. Orders should state engine speed and should be accompanied by dimension print of engine. Outfits complete with 1½ H.P. Gasoline Engine will be quoted on inquiry.

Suction Hose, Couplings and Strainer furnished to order at market rates.

DOUBLE-ACTING FORCE PUMPS

Rumsey "Excelsiors" are powerful force pumps, durable and easily operated. They are intended for use on board ship, in warehouse, mill or factory, or in private residence for general water supply or fire service. Noncorrosive working parts adapt these pumps to handling sea or mine water. These pumps are also particularly recommended for handling gasoline and oils, unloading tank cars, etc.

Their construction is simple and they are readily overhauled. They are regularly made with brass lined cylinder, bronze valves and seats, brass cased rod and brass gland. Lever is long and removable from socket. Priming plugs and drip plugs are provided. Suction and discharge are regularly fitted for iron pipe. They can be fitted with brass bushings and half hose couplings for hose connection to order at extra list.

Fig. 275 has single lever.

Fig. 274 has two levers. Note that each lever is attached directly to the piston rod.

Five and six inch pumps comply with U. S. Government and Lloyd's requirements for fire protection for vessels.

DIAPHRAGM PUMPS

Fig.	No.	Style	Suction Pipe Inches	Connection For Pipe Is	Capacity Per Hour Gallons	Approx. Weight Pounds
534	2	Bottom Suction	2½	Female	1800	118
534	3	Bottom Suction	3	Female	3500	164
534	4	Bottom Suction	4	Female	6000	252
535	2	Side Suction	2½	Male	1800	132
535	3	Side Suction	3	Male	3500	190
535	4	Side Suction	4	Male	6000	260

DOUBLE-ACTING FORCE PUMPS

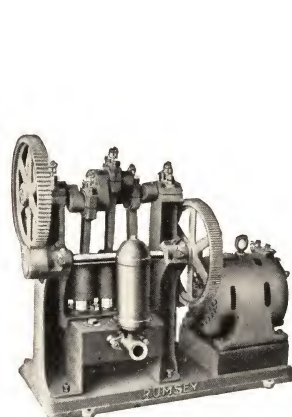
Fig.	Cylinder Diameter By Stroke Inches	Style	Cap Per Rev. Gal.	Pipe Sizes Inches	Approx. Weight Pounds	When ordered for Hose \$ Usual Hose Sizes	
						Suc. Inches	Dis. Inches
275	3 x 5	Single Lever	0.30	1¼	107	1¼	1
275	4 x 5	Single Lever	0.54	2	117	1½	1¼
275	5 x 5½	Single Lever	0.93	2½	177	2	1½
275	6 x 5½	Single Lever	1.34	2½	203	2½	2
274	4 x 5	Double Lever	0.54	2	145	1½	1¼
274	5 x 5½	Double Lever	0.93	2½	217	2	1½
274	6 x 5½	Double Lever	1.34	2½	232	2½	2

\$ With brass bushings and half hose couplings for both suction and discharge.

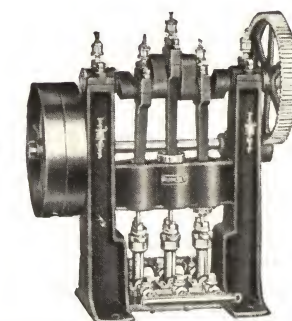
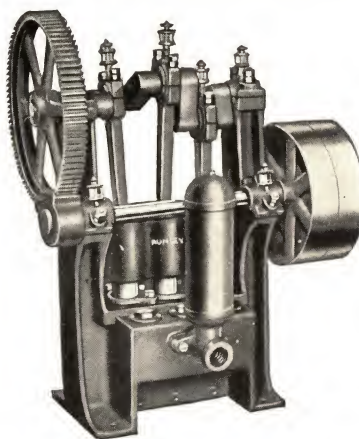
Rumsey Single Acting Triplex Power Pumps

Outside Guided Type

Fig. 681, Size 1½x3, Frame 3L



Electric "Drive AA"



Showing 6000 Pound Pressure Pump as Built to Order

Fig. 681 is a moderate pressure triplex pump for domestic and industrial water supply, boiler feeding, circulating, contractors' service, forcing fuel oil to burners, railroad tank pumping.

These machines are applicable to any pumping duty within the range of capacity and pressure specified for each size in the accompanying table.

Pumps can be furnished for handling cold or hot water or brine, for petroleum products such as fuel oil, gasoline, paraffin oil and naphtha, for chemicals such as cyanide, ammonia, alcohol, etc., for food products such as syrups, chocolate, etc., and for thick liquids like molasses, tar, heavy crude oil, etc.

Pumps may be belt driven, may be direct connected to driving shafts of suitable speed or may be geared, belted or chain connected to electric motors or other high speed drivers.

STANDARD SPECIFICATIONS

The standards, crosshead guide, valve box, cylinders and base are in one solid, rigid casting. The cast steel crankshaft is of the three-throw type. The gear and pinion are of semi-steel. Bearings are lined with best babbit. Connecting rods are of marine type with adjustable babbit boxes at crank end and bronze bushings at crosshead end, except on frame 6L2 and 6L3 pumps which have adjustable phosphor bronze boxes at both ends. Crossheads are cylindrical in form and travel in bored guides, except frame 6L2 and 6L3 pumps which have engine type cross-

heads with adjustable bronze shoes. Plungers are of hard iron, machined and ground, outside guided and packed. Glands are of iron with stud adjustment. Frame 2L1 pumps have bronze valves and valve seats. Frame 3L to 4½L inclusive pumps have bronze, rubber faced valves and bronze seats. Frame 5L to 6L3 pumps have rubber disc valves with bronze plate reinforcements, bronze grids-seats, bronze guides and springs. Each valve is accessible through a separate cover. Air chamber and all necessary oil cups, drips and wrenches are provided.

SPECIAL CONSTRUCTION

Hard rubber valves for hot water or bronze valves for oil, etc. can be furnished to order without extra charge.

No extra charge is made for pumps of all iron construction for cyanide. Bronze ball valves for thick liquids, rawhide pinion, motor drive and brass fittings (either brass covered or bronze plungers, brass lined or bronze glands and bronze bushed cylinders) are furnished to order at extra price, as are air compressor attachment for pneumatic tank pumping, by-pass equipment for boiler feeding, etc.

MOTOR DRIVE

Drive AA is the usual form of drive and consists of iron sub base for pump and motor, intermediate gear and rawhide motor pinion ready to receive motor of any speed up to 1800 R.P.M. Table below shows actual size of 40 degree rating motor recommended.

Fig. 681*

Plungers Diameter by Stroke Inches	Frame No.	Maximum Pressure Pounds †	CAPACITY, GALLONS		PIPE SIZES		Tight and Loose Pulleys Inches	SIZE OF MOTOR REQUIRED Pump Operating at 50 R.P.M.		
			Per Rev.	Per Minute at 40 to 60 R.P.M.	Suc. in.	Dis. in.		50% of Maximum Pressure	75% of Maximum Pressure	100% of Maximum Pressure
1¼x2	2L	150	0.033	1.2 to 1.8	1	¾	12x1½	¼	¼	¼
1¾x3	3L	150	0.09	3.6 to 5.5	1	1	12x2	¾	¾	1
2 x3	3L	130	0.12	4.8 to 7.2	1¼	1¼	12x2	¾	¾	1
2¼x4	4L	150	0.20	8 to 12	1¼	1¼	12x2½	1½	1½	2
2½x4	4L	150	0.25	10 to 15	1¼	1¼	12x2½	1½	1½	2
3 x4½	4½L	150	0.41	16 to 24	1½	1½	15x2½	2	3	3
3½x4½	4½L	150	0.50	20 to 30	1½	1½	15x2½	2	3	3
3½x5	5L	150	0.62	25 to 37	2	2	20x3	3	3	5
4 x6	6L1	120	1.00	40 to 60	2½	2½	20x4	5	5	7½
4½x6	6L1	120	1.24	49 to 74	3	3	20x4	5	5	7½
5 x6	6L2	150	1.53	61 to 91	3	3	24x5	5	7½	10
5 x6½	6L3	180	1.65	66 to 100	3	3	24x5	5	7½	10
5½x6	6L2	120	1.85	74 to 111	3	3	24x5	7½	10	15
5½x6½	6L3	150	2.00	80 to 120	3	3	24x5	7½	10	15

STANDARD GEAR RATIO 5 to 1. † One pound pressure is equivalent to 2.31 feet head. * Always mention Figure, Size and Frame Number.

Rumsey Single-Acting Triplex Power Pumps

Outside Guided Type

Fig. 698

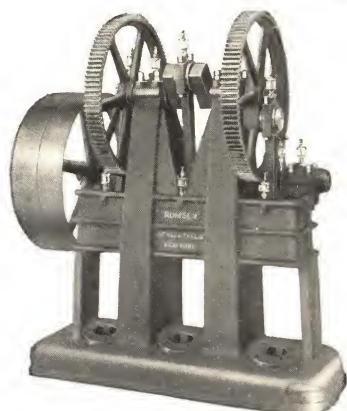
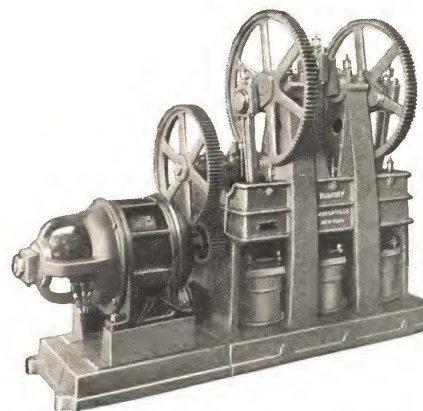
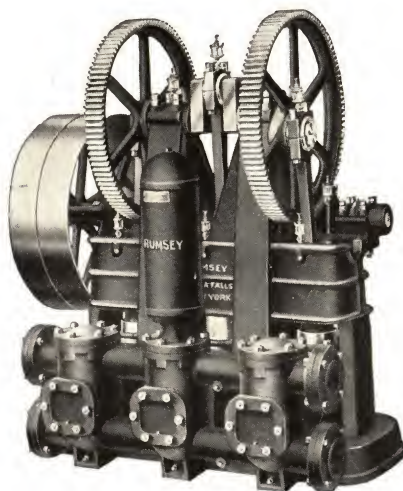


Fig. 698 with Cylinders, Plungers and Valve Boxes Removed, to show Strength of Main Frame and Perfect Balance of Frame and Driving Parts.



Rear View of Fig. 698, Showing "Drive A.D." the Most Popular Style of Motor Application to Pumps of this Class; Note Accessibility of Stuffing Boxes.

The pumps here shown are suitable for a wide range of applications—for industrial and municipal water supply, booster service, boiler feeding, circulating, mine pumping, elevators, pumping special liquors and chemicals, etc.

Pumps may be belt driven, may be direct connected to driving shafts of suitable speed, or may be geared or chain connected to electric motors or other high speed drivers.

STANDARD SPECIFICATIONS

The main frame, including base, standards with cross head guides and end supports, is a single rigid casting. The crank shaft is a single throw steel forging. Pinion shaft is steel. Gearing is double, of semi-steel, and has a ratio of 5 to 1. Crank and pinion shaft bearings are lined with best babbit. Pinion shaft bearings are ring oiling. Connecting rods are of marine type, with adjustable phosphor bronze boxes at both ends. Cross heads have adjustable bronze shoes of ample size travelling in bored guides.

The water end consists of three separate heavy cast iron* cylinders, heavily flanged and bolted firmly into the frame, to which the valve box bolts in turn. Plungers are of hard cast iron, machined true and ground to a true surface. They are outside guided and outside packed. Stuffing boxes are of liberal depth. Glands are of iron with stud adjustment, readily accessible. Valves are rubber discs, reinforced by bronze plates and work on bronze guides with cylindrically wound springs. Valve seats are of bronze of grid type. All waterways and valve areas are liberally proportioned. Each set of suction and discharge valves is accessible through a separate hand hole plate. Suction or discharge may be taken from either end of the

pump. Air chamber and all necessary oil cups, drips and wrenches are provided and each pump is fully packed and tested at the factory.

MOTOR DRIVE

Drive AD is the most popular form of drive and consists of extended base for intermediate gear and rawhide motor pinion ready to receive motor. Motors of any speed up to 1200 R.P.M. can be accommodated. Table below shows actual size of 40 degree rating motor recommended.

ENGINE DRIVE

For direct drive by gasoline engine pumps of this type can be furnished to order with special gear ratios of up to 7 to 1, to accommodate engine speeds of up to 280 to 350 R.P.M. according to speed at which pump is intended to operate. Pump pinion shaft is connected to engine shaft by friction cut off coupling. Slight variations in capacity can be further compensated by varying plunger diameter or by using hand controlled by-pass.

SPECIAL CONSTRUCTION

Hard rubber valves for hot water or bronze valves for oil, can be furnished to order without extra charge. No extra charge is made for furnishing pumps in all iron construction for cyanide. Bronze ball valves for thick liquids, rawhide pump pinions, brass fittings (either brass covered or bronze plungers, brass lined or bronze glands and bronze bushed cylinders), by-pass equipment, etc., are furnished to order at extra charge.

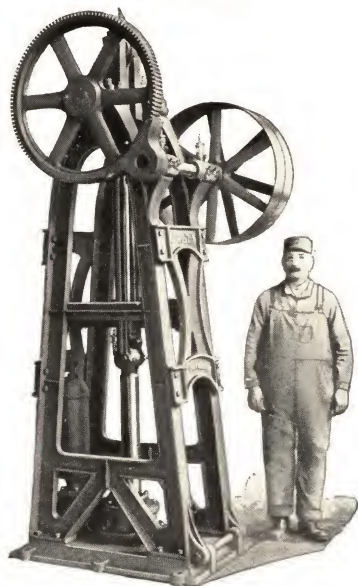
DATA ON LARGER TRIPLEX PUMPS ON APPLICATION

FIG. 698*

Plungers Diameter by Stroke Inches	Frame No.	Maximum Pressure Pounds †	CAPACITY, GALLONS		PIPE SIZES		Tight and Loose Pulleys Inches	SIZE OF MOTOR REQUIRED Pump Operating at 50 R.P.M.		
			Per Rev.	Per Minute at 40 to 50 R.P.M.	Suc. In.	Dis. In.		50% of Maximum Pressure	75% of Maximum Pressure	100% of Maximum Pressure
5 x 8	8 MH	200	2.00	80 to 100	3½	3	30x6	10 H.P.	15 H.P.	15 H.P.
5½ x 8	8 MH	165	2.46	98 to 123	3½	3	30x6	10 H.P.	15 H.P.	15 H.P.
6 x 8	8 MH	140	2.93	117 to 146	4	3½	30x6	10 H.P.	15 H.P.	15 H.P.
6½ x 8	8 MH	120	3.44	137 to 172	4	4	30x6	10 H.P.	15 H.P.	15 H.P.
6½ x 10	10 MH	200	4.30	170 to 215	5	4	42x6	15 H.P.	25 H.P.	30 H.P.
7¼ x 10	10 MH	160	5.35	214 to 267	6	5	42x6	15 H.P.	25 H.P.	30 H.P.
8 x 10	10 MH	130	6.50	260 to 325	6	5	42x6	15 H.P.	25 H.P.	30 H.P.

STANDARD GEAR RATIO 5 to 1. † One pound pressure is equivalent to 2.31 feet head. *Always mention Figure, Size and Frame Number.

No. 428



Rumsey Deep Well Working Heads

24 Inch Stroke

GENERAL

If the source of water supply is a well in which the surface of the water is more than 20 feet vertically below ground, a special deep well pump is required. This type consists of a cylinder lowered into the well and operated by a working head at the surface, the two being connected by pipe and rod.

The choice of equipment is determined by the work to be performed—the volume of water to be pumped and the total elevation, including all pipe friction, between the surface of the water in the well and the point of discharge. If the water level recedes under pumping or varies from other causes all figures should be based on the extreme low water level.

While the Rumsey line includes a full range of deep well working heads 4", 6", 8", 10", 12", 16" and 24" strokes, this catalog is confined to the heavier styles of 24-inch stroke heads for industrial and municipal supply.

Single acting cylinders and wood connecting rod are customary. If the maximum amount of water is wanted that can be pumped from a well casing of given size, double acting cylinders may be employed, providing that the total head does not exceed the 250 feet maximum for which a double acting cylinder is recommended. With double acting cylinders, extra heavy wrought iron pipe is used for connecting rod.

INQUIRIES

The following data should accompany inquiries for deep well pumping outfits to enable us to intelligently recommend the proper equipment:

1. The inside diameter of well casing.
2. The total depth of the well.
3. Distance from ground level to surface of water. Give the low water level if the water recedes under pumping or if the water level varies from other causes.
4. Vertical elevation above surface of ground and horizontal distance to which the water is to be forced (and inside diameter of pipe if laid.)
5. Capacity desired in gallons per minute.
6. Power available.

DESCRIPTION

Each of the four working heads tabled below is of the same general type as the smallest No. 428, here illustrated. Each is of the heaviest construction, differential plunger type for operating cylinders in deep artesian wells. Frame consists of two heavy standards, strongly braced by the center guide and cross plates and firmly bolted to the heavy base. Gearing is semi-steel, machine cut. Bearings are babitted. Crank shaft is of heavy steel, of single throw type. Connecting rod is of marine type, adjustable at top end in all sizes and at bottom end in all sizes but No. 428 which has bronze bushing only.

Single Acting
Cylinder and
Wood Connecting
Rod



No. 428 has 6.1 to 1 gear ratio and hinged base.

No. 426-0 and 426-1 have 5 to 1 gear ratio. Working heads of this class stand approximately 126 inches high over all and are made on frames double the weight of No. 428.

No. 426-2 has 5 to 1 gear ratio. This size is of the same general dimensions as Nos. 426-0 and 426-1 but heavier and with double gearing for the harder service. For belt drive, this size is provided with outboard bearing.

All working heads are fitted for well pipe, well rod and discharge pipe according to the size of cylinders which they are to operate.

Drive AD as
applied to
Working Head



Working Head Number	Gear Ratio	FOR BELT DRIVE		Maximum Head and Power Required with Single Acting Cylinder at 25 R.P.M.				Maximum Head and Power Required with Double Acting Cylinder at 25 R.P.M.			
		Tight & Loose Pulleys Inches	Weight	4¼x24"	4¾x24"	5¾x24"	6¾x24"	4¼x24"	4¾x24"	5¾x24"	6¾x24"
				37 G.P.M.	48 G.P.M.	67 G.P.M.	98 G.P.M.	68 G.P.M.	87 G.P.M.	125 G.P.M.	162 G.P.M.
428	6.1 to 1	30x5	2500	275 ft. 7½ H.P.	400 ft. 12 H.P.	500 ft. 14 H.P.	.....	228 ft. 7½ H.P.	185 ft. 7½ H.P.	125 ft. 7½ H.P.	.....
426-0	5 to 1	36x6	5000	220 ft. 7½ H.P.	340 ft. 12 H.P.	400 ft. 14 H.P.	.....	250 ft. 8½ H.P.	250 ft. 10 H.P.	250 ft. 15 H.P.	250 ft. 20 H.P.
426-1	5 to 1	36x8	5150	150 ft. 7½ H.P.	235 ft. 12 H.P.	300 ft. 15 H.P.	500 ft. 25 H.P.	Double Acting Cylinders are not ordinarily offered for total heads greater than 250 R.P.M.			
426-2	5 to 1	48x8	6700	.....	170 ft. 12 H.P.	225 ft. 16 H.P.	375 ft. 26 H.P.				

Select motor of any speed up to 900 R.P.M.

Centrifugal Pumps for all Purposes

The Figure 1905, shown in the cut on this page is our horizontal, side suction, centrifugal pump direct connected to vertical steam engine. Combined outfits of this kind are often used where but little elevation is required, owing to their compactness and portability.

It is not possible to run steam engines at the high speeds necessary for high elevations, consequently these outfits can only be used against comparatively low heads. Different sized engines are offered adaptable to various steam pressures. The heads in table below are for 80 lb. steam pressure.

On size No. 5 and larger, the pump shell is made with removable suction head as shown in illustration on opposite page.

Smaller sizes are made with suction head and shell cast in one piece.

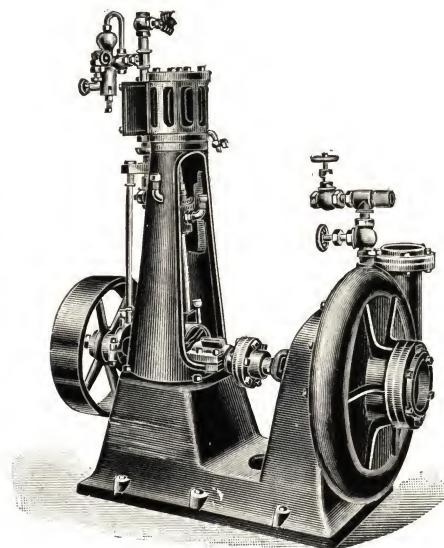


Fig 1905

Fig. 1905 — Sizes, Capacities, etc.

No. Pump	Economical Capacity Minute	For Heads up to	Size of Pipe		Size of Engine	
			Disch.	Suct.	Diam.	Stroke
2	120 Gals	15 ft.	2 in.	3 in.	3½ in.	3½ in.
2½	185 "	20 "	2½ "	3½ "	3½ "	3½ "
3	265 "	15 "	3 "	4 "	3½ "	3½ "
3	265 "	15 "	3 "	4 "	3 "	5 "
3	265 "	25 "	3 "	4 "	3½ "	5 "
3	265 "	30 "	3 "	4 "	4 "	5 "
3½	360 "	15 "	3½ "	4½ "	3½ "	3½ "
3½	360 "	25 "	3½ "	4½ "	4 "	5 "
4	470 "	20 "	4 "	5 "	4 "	5 "
4	470 "	25 "	4 "	5 "	4½ "	5 "
5	735 "	5 "	5 "	6 "	4 "	5 "
5	735 "	10 "	5 "	6 "	4½ "	5 "
5	735 "	20 "	5 "	6 "	5 "	7½ "
5	735 "	30 "	5 "	6 "	6 "	7½ "
6	1060 "	10 "	6 "	8 "	5 "	7½ "
6	1060 "	25 "	6 "	8 "	6 "	7½ "
8	2000 "	15 "	8 "	10 "	7½ "	8 "
8	2000 "	25 "	8 "	10 "	7½ "	9 "
10	3000 "	25 "	10 "	12 "	9 "	9 "
10	3000 "	30 "	10 "	12 "	10 "	10 "
12	4300 "	15 "	12 "	15 "	9 "	9 "
12	4300 "	20 "	12 "	15 "	10 "	10 "
12	4300 "	30 "	12 "	15 "	12 "	12 "

We direct connect our Side and Double Suction Pump with any form engine and will quote on special outfits when desired.

Ejectors furnished only when ordered.

Centrifugal Pumps (Continued)

The Figure 1909 shown on this page is our Gravel and Dredging Pump.

The shell or casing is the solid type and it is so arranged that the discharge can be adjusted to various angles. A removable front head permits inspection of interior without disturbing discharge pipe connection. The frame and bearings are heavy and ample for hard continuous service. The casing and impeller are of semi-steel which prevents rapid cutting out and wear of these parts.

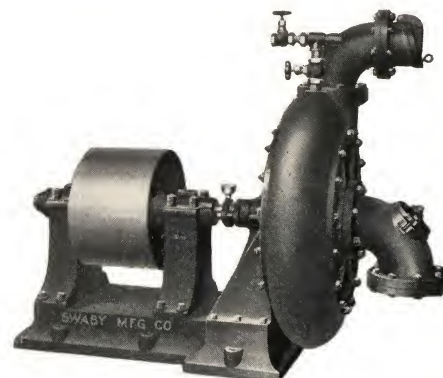


Fig. 1909

Figure 1909 — Sizes, Capacities, etc.

No. Pump	Cu. Yds. Solids per Hour Per Cent Solids		Size Disch. & Suct. Pipe	Pulley		Diameter of solids Pump will pass
	10 %	20 %		Diam.	Face	
4	14 yds.	38 yds.	4 in.	12 in.	12 in.	2 in.
6	30 yds.	60 yds.	6 in.	18 in.	12 in.	4 1/2 in.
8	60 yds.	120 yds.	8 in.	24 in.	12 in.	6 in.
10	90 yds.	180 yds.	10 in.	30 in.	14 in.	8 in.

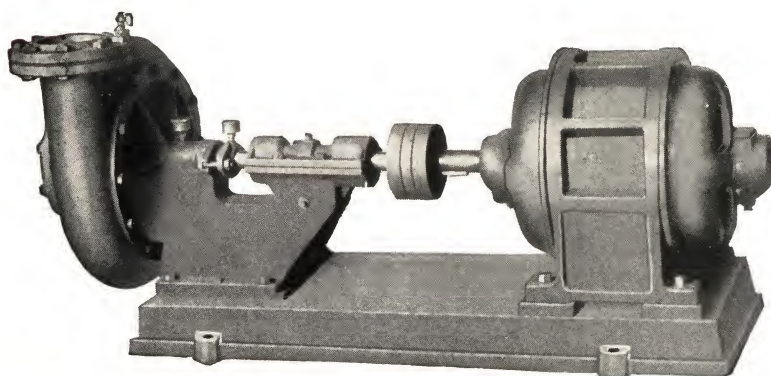


Fig. 1906

The Figure 1902 as illustrated is our standard, horizontal, side suction centrifugal pump. It is designed and constructed along very liberal and substantial lines. All parts are machine finished and accurately fitted insuring close running fit and efficiency.

The shafts are of ample diameter and two generously proportioned bearings of the chain self oiling type are provided on all sizes from 1 1/2" up. The shell is overhung permitting adjustment of the discharge to almost any desired angle.

These pumps can be fitted with tight and loose pulleys at an extra charge.

Size 3/4 inch is only suitable for heads up to 30 ft. 1 inch for 40 ft., other sizes 100 ft.

Brass fitted pumps have runner and shaft of brass.

These pumps are furnished in 16 sizes ranging from 3/4 inch discharge at 10 gallons per minute to 20 inch discharge at 12,000 gallons per minute and for elevations to 100 ft. or equivalent pressure.

The Figure 1906 as illustrated herewith, is our horizontal side suction centrifugal pump mounted on cast iron base with flexible coupling for direct connection to electric motor.

The frame and bearing are in one substantial casting. The bearing is of the self oiling chain type with split cap and ample oil reservoir. A ball thrust bearing and adjustable shaft collars are also provided.

Inquiries for this type must specify capacity required, total head and nature and voltage of electric current available.

These pumps are furnished in 13 sizes ranging from 5 gallons per minute to 3000 gallons per minute and for elevations to 100 ft. or equivalent pressure.

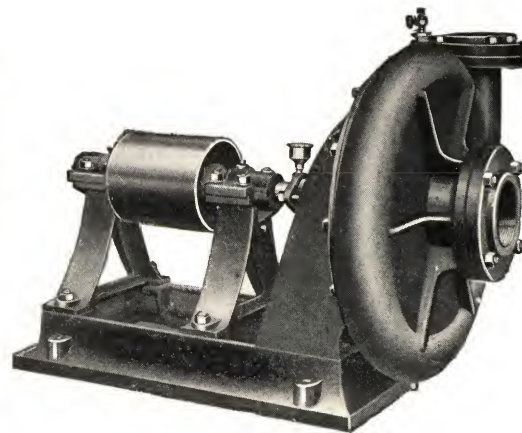


Fig. 1902

Use Barber-Greenes on City Paving



Chapman & McCloud, Hillside, N. J., load carts with a Barber-Greene.



Modern Construction Co., Freemont O. The Barber-Greene is fitted with a special hopper which the wheelbarrowman can dump easily.



Utility Const. Co., New Brunswick, N. J., use a Barber-Greene.



L. P. Beard, Indianapolis, Ind., city paving carried on with Barber-Greenes and C. H. & E. tractors.



The Toronto Transportation Commission, Toronto, Ont., Canada, used twelve Barber-Greenes to load batch-boxes on trucks.



H. G. Goelitz, Oak Park, Ill., has four Barber-Greenes.

Brief Specifications—Model 42 Barber-Greene

Self-Feeder—Two 36" flat horizontal steel discs rotate toward the center, feeding the buckets. Digging width 6' 4". Patented.

Transmission—Truck transmission. Four speeds, 3' per minute—for digging—60' and 120' per minute for traveling. Reverse 35' per minute. No differential.

Clutches—Master clutch of multiple dry disc type foot lever control. Two clutches outside-band type on the jack shaft control

the movement and steering of machine. Differential eliminated. One adjustment on clutch.

Crawler Traction—Tread width 10", length 60". Track surface is cast integral with the link of 40-carbon steel. Tight housing for all other moving parts.

Power—Buda 4-cylinder, truck type Model WTU $3\frac{3}{4} \times 5\frac{1}{8}$ rated at 30 HP. Full force feed oil lubrication, water pump, removable cylinder heads, three-point suspension.

Buckets—Cast steel buckets, 20 x 9, spaced 18 inches on two strands of 6-inch pitch steel and malleable chain. Buckets are offset, cleaning a width on the discs of 22 inches.

Elevator—Digging discs may be adjusted accurately or the whole assembly tipped to a nearly horizontal position by means of two separate hand wheels.

Frame—Built of heavy angles and channels riveted together. Three-point suspension. Rear axle a heavy steel casting. Front axle built up of steel castings and boiler plate.

Discharge Spout—Pivoted to swing thru an arc of 180 degrees. Controlled from operator's platform. Discharge height 9' 6".

Measuring Hopper—Variable capacity up to 21 cu. ft. Can be set to discharge to any one of three sides.

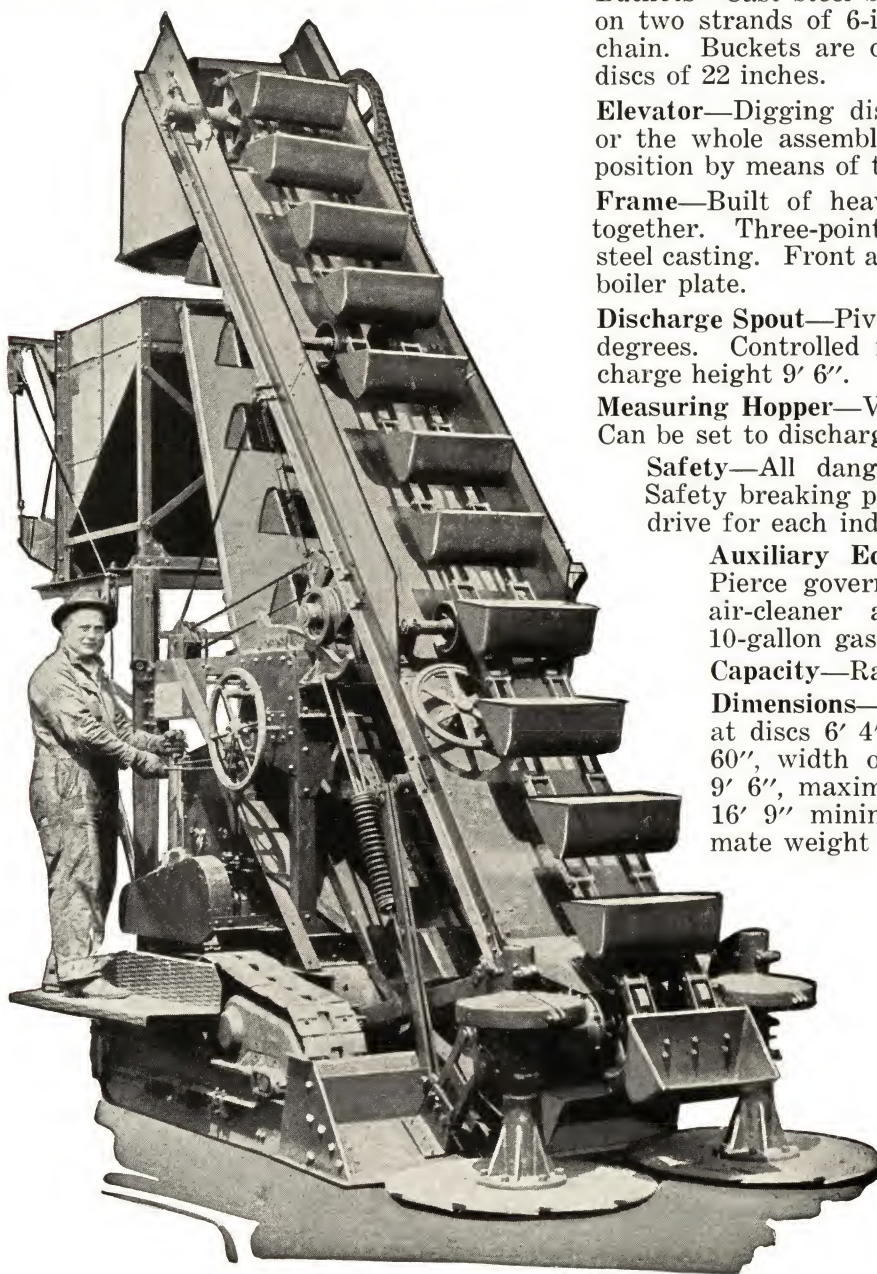
Safety—All dangerous moving parts enclosed. Safety breaking pins on elevator sprocket and on drive for each individual crawler.

Auxiliary Equipment—McCord radiator, Pierce governor, Eisemann magneto, United air-cleaner and Stromberg carburetor. A 10-gallon gasoline tank with sediment bulb.

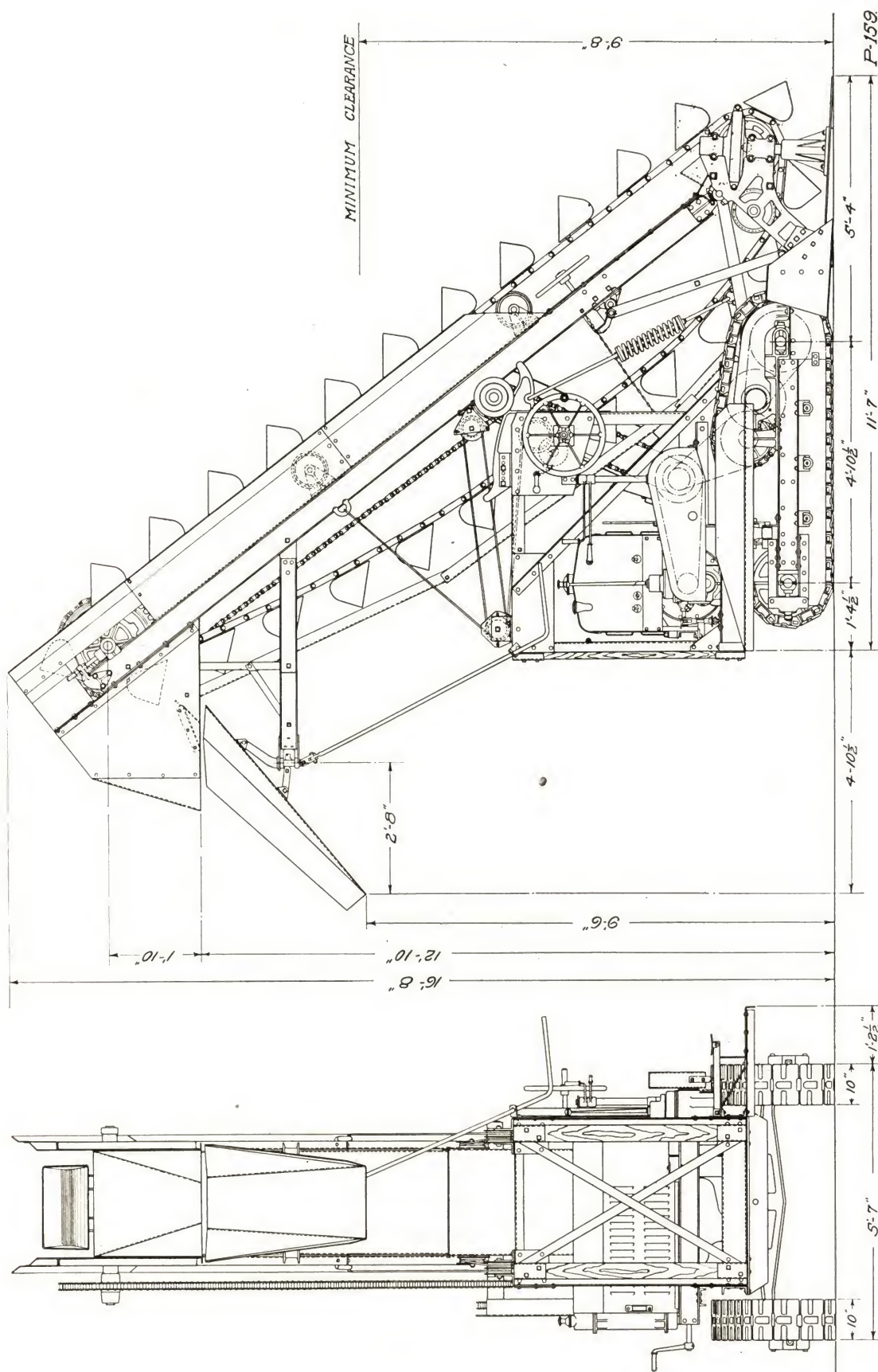
Capacity—Rated at $1\frac{3}{4}$ cu. yds. per minute.

Dimensions—Length over all is 11' 9", width at discs 6' 4", length of crawlers on ground 60", width of tread 10", discharge height 9' 6", maximum height in working position 16' 9" minimum for shipping 10', approximate weight 11,000 lbs.

Control—Steering through two independent friction clutches, one controlling each crawler. By manipulating these clutch levers one crawler can be stopped while the power is applied to the other, turning the machine around in the length of its crawlers. Shifting gears for different speeds as in a truck. A third lever operates the clutch for the elevator. Speed is automatically regulated by the governor.



STANDARD SALT AND CEMENT COMPANY — DULUTH



BLUE PRINT ISSUED

REVISIONS

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BARBER GREENE CO.

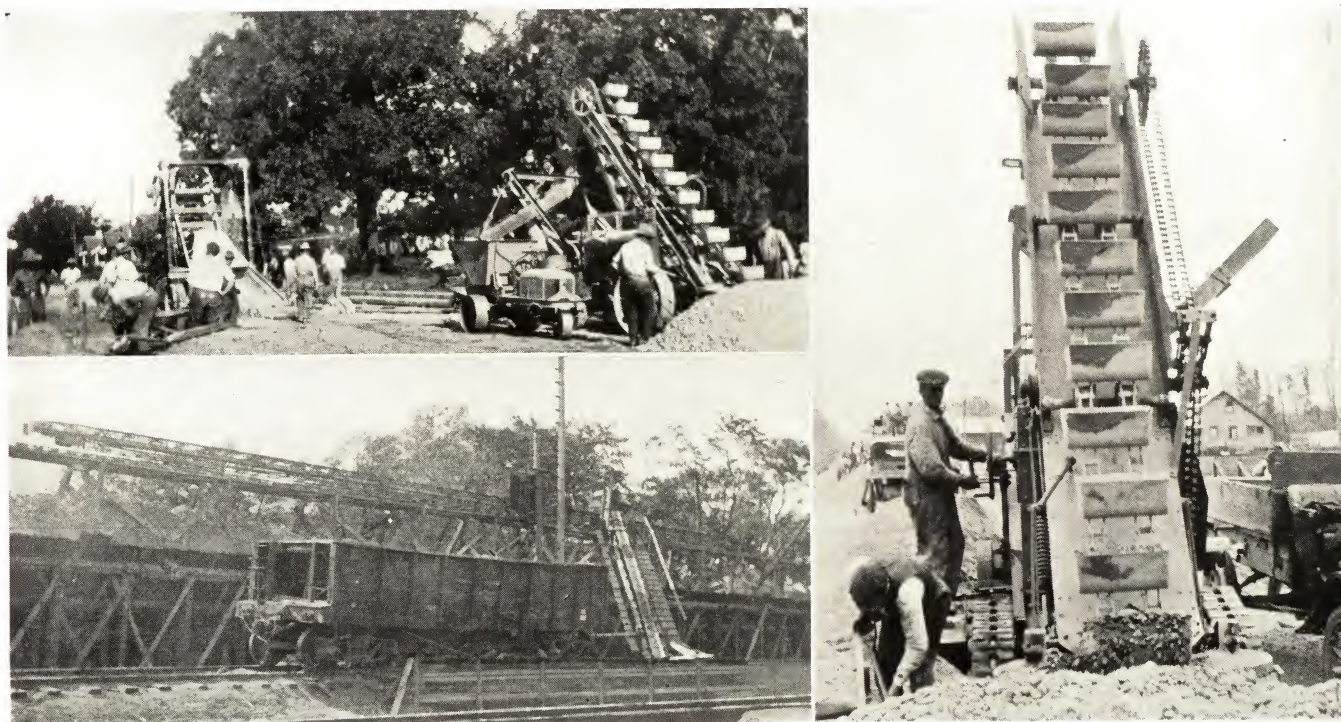
AURORA, ILL.

MODEL 42 LOADER

P-159.

City of Minneapolis Belives in Barber-Greenes

Uses B-G Belt Conveyors, a Model 19, and a Model 42



The top picture shows the first Barber-Greene machine used by the City of Minneapolis. It is a Model 19 self-feeding bucket loader and is still in use. It does not have the crawler traction but has the double disc feeder which distinguishes all Barber-Greenes. The photograph at the right shows the Model 42, the latest model of this same type of machine.

The two Barber-Greene bucket loaders are used in separate gangs for paving in various parts of the City. Trutractors or Ford trucks are used to haul to the mixer. Base courses are usually 5" thick and 30' wide, 1-3-6 mix with a 2- or 4-bag batch. Sand and stone are hauled to the job and stored on the grade. The record run is 1720 square yards in one day. The average runs for both machines are each over 1000 square yards per day. It is estimated that each machine does the work of twelve laborers—if they could be obtained for shoveling stone.

The other picture shows two Barber-Greene conveyors being used for handling materials in bridge construction. The long horizontal conveyor was mounted as a shuttle so that it could be moved back and forth, thus discharging into

any desired bin below it. The shorter conveyor took the material from the track hopper and delivered it to the long conveyor.

This is only one example of the use of Barber-Greenes among municipalities. The City of Old Towne, Maine, Milwaukee, Wisconsin, Denver, Colorado, and many others are using these machines to load scarified macadam, crushed rock, sand, ashes, and other bulk materials. Many others who have our Snow Loader also have the bucket loader parts for making the snow loader into a bucket loader for use during the summer.

A few other municipal users of Barber-Greene equipment are:

Little Rock, Arkansas
Fort Wayne, Indiana
Grand Haven, Mich.
Laconia, N. H.
Schenectady, N. Y.
South Beloit, Wis.
Norwalk, Conn.
Rockford, Ill.
Boston, Mass.
Springfield, Mass.
Worcester, Mass.
Middleboro, Mass.

Wareham, Mass.
Duluth, Minn.
Manchester, N. H.
East Orange, N. J.
Newark, N. J.
Poughkeepsie, N. Y.
Watertown, N. Y.
Lowville, N. Y.
Geneseo, N. Y.
Burlington, N. C.
Durham, N. C.
Miamisburg, Ohio.

County Cuts Road Surfacing Cost

A Barber-Greene Loads for Less



"... enclosed you will find photographs of a gravel surfacing job in which I use the Barber-Greene loader exclusively. This is a continuous run of 32 days, with 6 trucks hauling 4 yds. per truck on an average haul of 4 miles; and an average daily haul of 157 yds. per day; making an average cost of 22 cents per yard per mile.

"The previous year the same surfacing job was done without the Barber-Greene loader, using teams and trap with an average cost of 32 cents per yard per mile.

"Am enclosing two snapshots of the B-G loader at work on this job. Use the one that you prefer.

Signed by

T. W. Shearer,

Arapahoe County Road Supt.,

Littleton, Colo.

Nov. 19, 1923.

And another county superintendent writes as follows:

"One of the best pieces of equipment that Hickman County has," says L. N. Totty, county superintendent, describing their Barber-Greene self-feeding bucket loader.

He uses it for loading gravel direct from bank to trucks or wagons. Capacity of the wagons is 2 cu. yds. and of the trucks $11\frac{1}{2}$ cu. yds. During an average day the Barber-Greene loads 49 wagons and 10 trucks. It could load more, but the average haul is 6 miles, so that the machine has considerable waiting time between loads. The maximum amount handled was 362 cu. yds. in 7 hours.

Fifteen men were replaced by this one machine. One operator and three helpers are used. The helpers break down the bank.

Only a few county jobs are shown here. Many other counties are Barber-Greene users as also are highway districts, townships, etc. Whether doing a graveling job or building concrete roads, Barber-Greene's are valuable for their quick and low-cost loading. They aid in keeping within your appropriation and make it possible to do more work at the same time.

Following is a partial list of counties, municipalities, etc., that use Barber-Greene's:

Pinal County, Ariz.; State of California; Gov. of Vancouver; Marshall County, Ind.; Cook County, Ill.; Kane County, Ill.; Ashtabula County, O.; Portage County, O.; State of Ohio; Trumbull County, O.; Ashland County, Wis.; Deuel County, Minn.; Fremont County, Colo.; Cline County, Fla.; Ingham County, Mich.; Gallatin County, Mont.; Durham County, N. C.; Snohomish County, Wash.; Winnebago County, Wis.; Toronto Transportation Commission; Canadian National Parks; Conejos County, Colo.; Pueblo County, Colo.; City of Colorado Springs; State of Colorado; Chatham County, Ga.; Burley Highway District, Idaho; Macon County, Ill.; Hendricks County, Indiana; Tippecanoe County, Indiana; St. Louis County, Mo.; Cortland County, N. Y.; State of New York; Washington County, Pa.; Salt Lake County, Utah; County of Cowlitz, Wash.; Milwaukee County, Wis.; and many others.

Barber-Greenes for Loading Batch Boxes

Many Possibilities for Use With Industrial Systems



Loading sand and stone into batch-boxes for the Toronto Transportation Commission.

By using Barber-Greenes and storing in advance, it is possible to reduce greatly the amount of track needed for any job. The advantages of track and of advance storage are thus combined. Batch boxes on trucks can be loaded as readily.



Loading sand into batch-boxes on truck for a city paving job in Hammond, Ind.



With Barber-Greenes, List & Hallett used only 1890 feet of industrial track



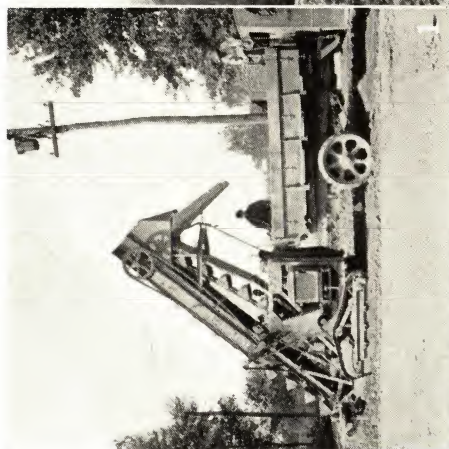
The shortest industrial track system.
C. M. Kirkpatrick.



This machine handled 42,000 yards with the minimum of repairs
Brereton & Bauck, Emmetsburg, Ia.

Load Scarified Macadam with Barber-Greenes

1. Humbard Const Co., Middleborough, Ky. Barber-Greene used to load scarified macadam.
2. Same machine equipped with measuring hopper loading slag.



3. Same machine loading sand.
4. Discharging into a truck. The swivel spout is controlled by the operator. City of Little Rock, Ark.
5. Note the kind of material being loaded. The colored helper is reaching down to release the tow chain which helps keep a wagon spotted under the spout while the Barber-Greene moves.



6. Shea & Co., Hammond, Ind., loading scarified macadam.
7. Closeup of discs in action T. H. Riddle, New Brunswick, N. J.
8. Showing special perforated chute designed and built by Riddle for salvaging scarified road materials.
9. Barber-Greene with special chute in action.

Contractor Stores Cement in Advance

White Const. Co. Get all the Cement on Hand for a 7½ Mile Job

With the assistance of a Barber-Greene conveyor, four men starting February 5, were able to unload and store 96,616 sacks of cement—enough cement for a 7½ mile job—by March 28.

Due to the fact that during the first ten days the four men unloaded and stored without any mechanical assistance, a good chance for comparison between hand unloading and unloading with the Barber-Greene was afforded. In these first ten working days unloading entirely by hand, the four men stored 5,000 barrels. During the next twenty working days, using the Barber-Greene con-



The Cement is Piled All the Way up to the Roof

veyor, the same four men stored 15,000 barrels. In twice as many days, they stored three times as much with the aid of the Barber-Greene.

In an ordinary day, by the help of the conveyor, they would unload and store in the shed as shown, two cars containing 968 sacks and two cars containing 692 sacks. Due to the fact that the conveyor acted as a pacemaker, four cars per day were averaged steadily all the time it was used.

The cost of building the sheds and unloading was about 20 cents a barrel. This work was carried on by the White Const. Co. at Prairie View, Ill.



Conveyors Increase Your Crusher Storage

Ground Storage Insures Steady Operation



In order to work your crusher to capacity, large storage is necessary. Ground storage by a Barber-Greene portable belt conveyor is the most economical and fastest method.

As shown above, the Barber-Greene gasoline-driven conveyor used by the Highways Improvement Company, South Bend Indiana, takes the material direct from the screen to storage as fast as it flows. By swinging the conveyor in a circle with its hopper as the pivot, almost unlimited storage is built. The pile shown here is about twenty feet high and contains approximately 7000 cubic yards.

When you are hauling, ground storage eliminates tie-ups of the trucks when the crusher cannot operate, and makes it possible to operate the crusher when the trucks cannot haul.

This means a larger seasonal production from the crusher, and a smaller investment in haulage equipment.

During the months when you are not hauling,

a Barber-Greene conveyor keeps your crusher plant—and the dollars invested in it—working to capacity anyhow by storing as shown.

The rocks to feed the crusher in this case were hauled in from their fields during the winter by farmers. After being given the contract for building a macadam road near South Bend, Mr. M. T. Calef went prospecting through the territory and contracted with the farmers for their glacial rock. In this way he kept his crusher working all winter.

The insert shows how reclaiming can be done economically and quickly by one man. One man and a Barber-Greene will load crushed rock at the rate of $1\frac{3}{4}$ cubic yards per minute.

Adaptability of Barber-Greene loaders and conveyors to all kinds of material handling problems is proved by the records made by many of these machines. Ask our representative as to their possible labor-saving ability on your job. No obligation.

Stock Piles Quickly Built, Quickly Reloaded

Load or Store With Barber-Greene Equipment

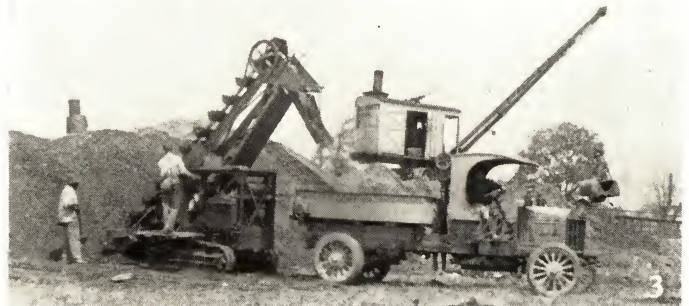


1. Conveyors unloading from cars to storage. Note the other conveyor storing stone from the crusher. These conveyors have also been used to handle coal and wet concrete.



2. Loading from a stock pile, built by a B-G conveyor.

3. On this job, working side by side with a $\frac{3}{4}$ -yard crane, the Barber-Greene loaded a greater average number of trucks.



4. Conveyors equipped with either gasoline engine or electric motor can be used to load trucks, etc. A fast loading speed can be obtained with comparatively little investment.

5. In England, tarred macadam is greatly favored for road surfacing. Conveyor hopper is fed direct from hot tar mixing chamber. Barber-Greene with disc feeder loads the tarred stone quickly and easily.



Pit Work Calls for a Variety of B-G Applications

1. Long, permanent Barber-Greene conveyors are becoming increasingly popular. Heavier drive ends with the standard intermediate sections make for quick and economical conveyor installations of any length.



2. Getting out chert in Tennessee. Same machine later used to load scarified macadam. Moore Const. Co.

3 and 4. How Taggart Bros. & Tebb, Cowley, Wyo., used two B-G conveyors with a No. 3 Austin Gyrtatory crusher. A small sump was built over the hopper end which bridged it for about sixteen feet. With this outfit, 400 yds. in eight hours are easily handled.



5. Loading trucks for Cook County, Illinois.

6 Digging direct and screening with a small home-made screen. J. J. Malloy.

7. A type U conveyor loading direct from bank to truck. Note the same type of screen as used in No. 6. Pierce & Piron, Aurora, Ill.



Use Barber-Greene Equipment for Unloading Cars

5. S. F. Wilson, Penn. contractor, using an old style Barber-Greene. This machine has the disc feeder which enables it to pick up material as well as the later models.



1 and 2. Shows a conveyor unloading from a track hopper direct to storage piles on trucks. With a single machine and one or two men as many as 10 or 12 cars can be unloaded in a day. The Standard Slag Co., Youngstown, O., made a record of 16 cars of slag unloaded in a day.

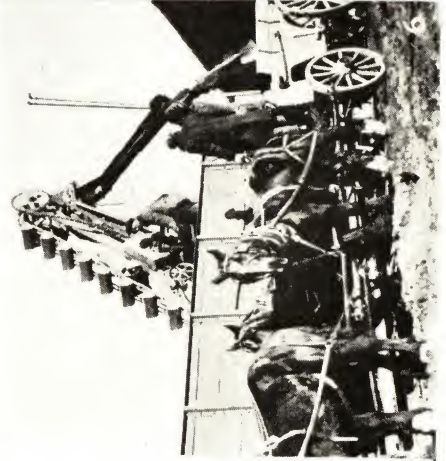
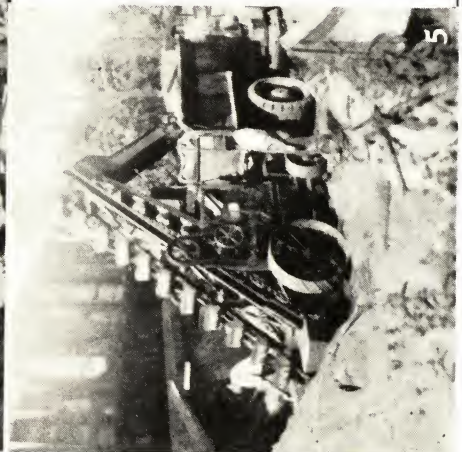


6. G. W. Humphrey, Aberdeen, S. D., obtained the use of a number of flat-bottomed cars which he shuttled between his pit and his road graveling job. The Barber-Greene worked inside the cars, unloading into 2-yd. wagons and 2-yd. trailers. Average was 1-yd. per minute and 32 yds. in 37 minutes, including time consumed in spotting wagons and trailers.



3. This shows Gray Bros., Ohio contractors, unloading cars.

4. A Barber-Greene self-loading bucket loader can be used to unload cars also. The Liberty Eng. Co., Chicago, unload a 50-ton car in 1½ hours by this method.



A Few Special Conveyor Applications

Showing B-G Applications to Other Construction Jobs



1 and 2. John J. Hart Const. Co. making a fill for the Lake Erie & Eastern, Youngstown, O. Five 60' Conveyors. Unload 20 to 25 cars of slag in 8 hours with each conveyor. Five men.



3. Making a fill on marshy ground where no wagon could go.

4. Aiding excavaton. Handling clay for the Leonard Const. Co., Chicago.

5. U. S. Structural Co. Portable Conveyor made it possible to mount mixer high enough to pour by gravity.



6. A protection built to feed the conveyor belt evenly when trucks dump into this hopper.

7. Barney-Ahlers Const. Co. using Barber-Greene conveyor on wooden frame to carry materials over marshy ground to their mixing plant.



Barber-Greene Type "U" Conveyor



[Patents Pending]

A Small Portable for Universal Service

The Type U is a one-man machine for universal use. It is made in one size only, being 22 feet long and having a belt width of 12 inches. Cupped cross cleats every 18 inches, continuous side cleats on both sides of the belt, and continuous skirt boards give this machine as great or greater capacity than the ordinary 18-inch troughed belt. It will handle large lumps also.

As a rule, it handles about 26 tons of coke per hour, 44 tons of coal, and 90 tons of gravel. The amount per hour depends on the nature of the material and the conditions of loading.

All adjustments can be made quickly and easily. A hand crank operates a self-locking worm winch for elevating the discharge end to any height desired, up to an angle of 35 degrees. The belt adjustments are of the sliding frame type. They can be made quickly and easily at the lower end.

Throughout the construction is rugged, plain and foolproof. On the truck no pro-



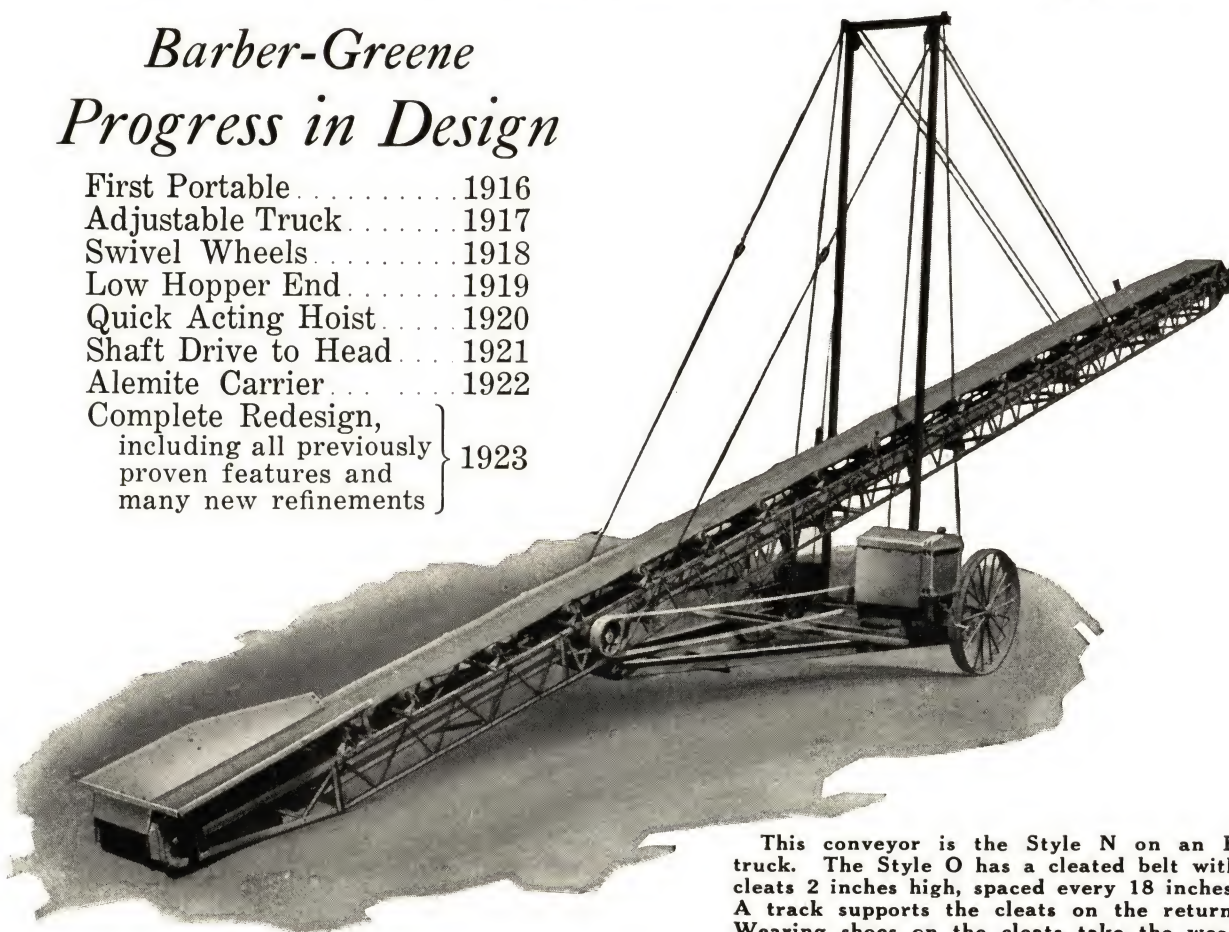
jecting rods or long cables are found to interfere with the use of the machine in restricted quarters. It is raised or lowered quickly by means of the hand crank only.

When an electric motor is furnished it is mounted in the frame. This protects it from accidental damage and from the weather. When a gasoline engine is used, it is mounted on a special truck at the side of the machine to relieve the conveyor of vibration and make the engine more accessible.

Style "N" Portable Belt Conveyor

Barber-Greene Progress in Design

First Portable	1916
Adjustable Truck	1917
Swivel Wheels	1918
Low Hopper End	1919
Quick Acting Hoist	1920
Shaft Drive to Head	1921
Alemite Carrier	1922
Complete Redesign, including all previously proven features and many new refinements	1923



This conveyor is the Style N on an E truck. The Style O has a cleated belt with cleats 2 inches high, spaced every 18 inches. A track supports the cleats on the return. Wearing shoes on the cleats take the wear from this track.

Styles N and O Portable Belt Conveyors can be furnished in practically any length from 18 feet to 60 feet with 18-inch or 24-inch belts, as desired. Electric motors or gasoline engines furnish the power.

For unloading cars, loading trucks, building stock piles, for loading bins or carrying to other high storage these large portable machines will be found economical and adaptable machines.

The Style N Conveyor is made the leader of this type of conveyor because of the long experience Barber-Greene designing engineers have had in building portable belt conveyors. The first portable was built by Barber-Greene in 1916, and since that time Barber-Greene machines have been steadily improved to meet the increasing problems of handling material such as coal.

Note under the listing "Progress in Design" that the adjustable truck was soon de-

veloped after the first portable conveyor. By means of the adjustable truck, the machine can be set to build a stock pile 20 feet or 30 feet high or set to discharge into a wagon without breakage. Various trucks to fit various conditions can be furnished.

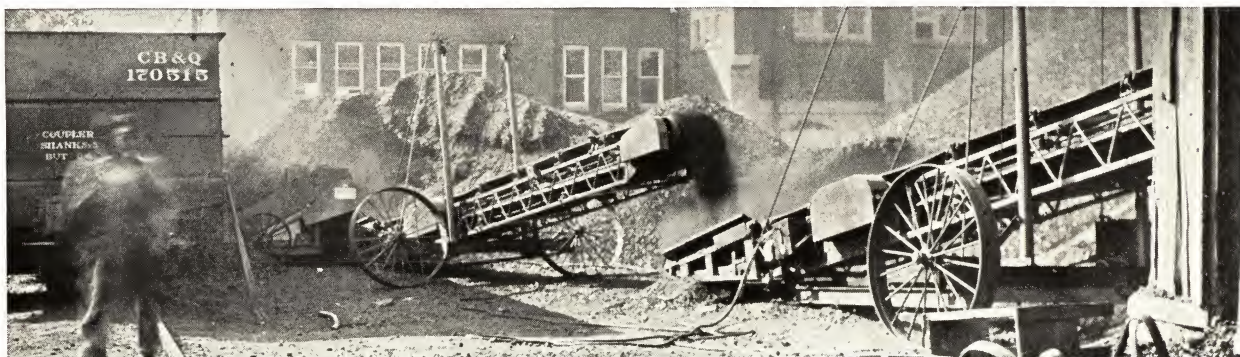
Swivel wheels permit the swinging of the machine in a circle about its hopper as a pivot. Greater storage can thus be obtained.

The hopper is low enough to provide easy shoveling if men are loading the belt, or to permit the machine to be placed under a car.

Design and construction of the Alemite-lubricated carrier prevents dust entering the carrier bearings and insures the best lubrication possible.

For further details send for our 12-page circular describing the construction of this high-class conveyor. No obligation. Just send in a card.

Coal Feeder Gives Unloading Speed No Shovel Gang or Track Hoppers



Showing a Coal Feeder keeping two 24-inch belt conveyors busy



Close-up of Coal Feeder under the car



All Barber-Greene machines fully protected by patents issued or pending.

The
Barber-
Greene
Coal
Feeder

A 50-ton car of screenings unloaded in 55 minutes is the record made at the St. Charles Home for Boys at St. Charles, Ill., by the equipment shown in the picture above. This excellent performance is made possible because of the volume delivered to the 24-inch belts by the Barber-Greene Coal Feeder working under the car.

In this case the Feeder is placed under the car but over the rails. The car is dumped directly onto it. As shown in picture No. 2, the machine is partially buried with the coal. This does not affect the operation of the machine, however, as it pulls out all the coal it can carry.

Where the elimination of hand labor is a greater consideration than speed, the Feeder can be used with a track hopper. By adjusting the plates over the flights, the proper amount of material which the machine will carry can be regulated. One man in the car, shoveling the comparatively small amount which will not flow, can unload a car in record time.

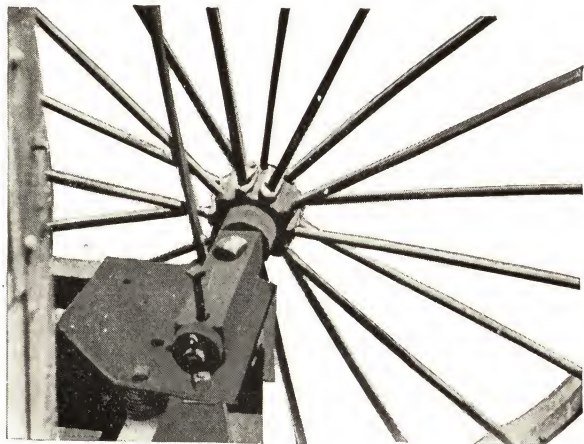
Besides increasing the unloading and storing speed of other conveying equipment used in conjunction with the Feeder, it increases the life of the rubber belt because it feeds at a continuous and uniform rate.

The flights of this machine are made of heavy built-up channel shapes fastened at each end to a special attachment of steel-bushed roller chains running in a heavy steel trough. Drive is from the front end.

Further specifications can be forwarded at your request. No obligation.

STANDARD SALT & CEMENT CO.
DULUTH, MINNESOTA

Convenient Features on E Trucks



—SHORT SHAFT AND BASE FOR SWIVELING WHEELS—

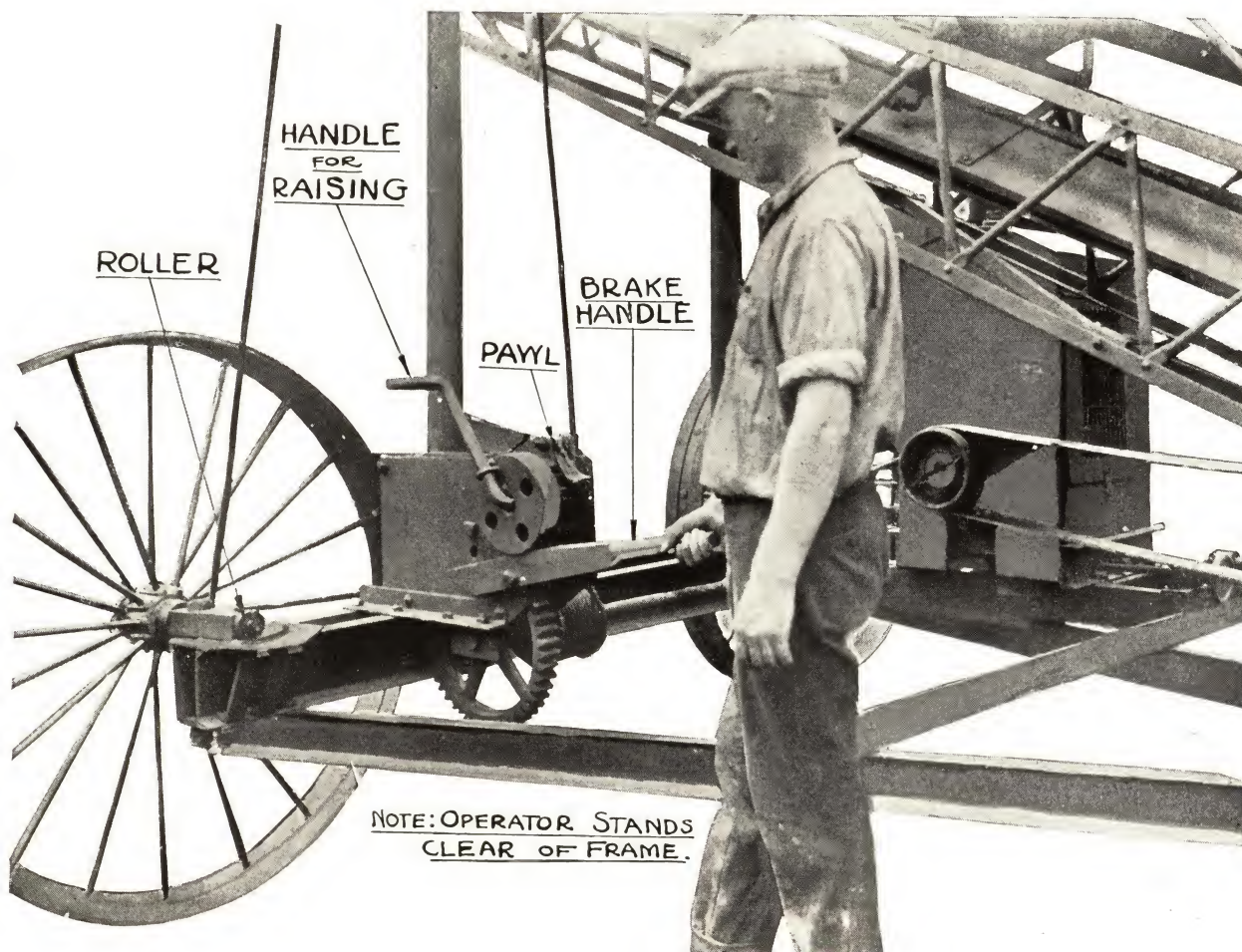
Refinements in conveyor construction are illustrated on this page. On the end of the short shaft we have placed a roller to aid in swiveling the wheels. This illustrates the attention to details which our long experience in designing and building portable conveyors enables us to give.

Several features of the Style E truck are illustrated in the large photograph below. For safety, the hoist is so placed that the operator stands clear of the main frame at all times.

The handle is placed at a convenient height so that the maximum force may be exerted. A chain of gears makes it easy to raise the frame to the maximum height. To lower, disengage the pawl, and apply the brake to regulate the speed.

Various sizes of the E truck are available. On an E-20 truck a 60' conveyor can be elevated to discharge to a height of 31'.

Use an E truck for most work, except where conveyor is used in a horizontal position or nearly so. For electric drive use E-6, 9 or 12 on which worm-gear hoist is furnished. For gasoline drive use E-9, 12, 16 or 20, all furnished with spur-gear hoist.



Other Trucks for N and O Conveyors

The K truck is used where it is desired to use a series of conveyors, one discharging to another.

The K-12 has castor wheels and should be used only on concrete or other good flooring. This truck is made with adjustment so that it can be set at vertical position whether the conveyor is horizontal or inclined. The K-30 has larger wheels better adapted to rougher yards. The castor effect is not lost as the wheels can be swiveled. The discharge heights can be varied slightly on these trucks.

Sometimes an F truck is used where a machine is required to work where overhead obstructions will not allow an E truck. It is possible to adjust the discharge by bolting through different holes punched in the angles.

Three styles of F trucks can be used. F-3 has 30" wheels, can be used on conveyors only 21', or less, in length. This truck gives a minimum discharge of 5'4" and a maximum of 9'7".

F-4 has 42" wheels, can be used on lengths of 21' or less, and gives a minimum discharge height of 6' and a maximum of 10'6".

F-5 has 42" wheels, but is heavier than the F-4. It can be used with conveyors as long as 27'. Minimum discharge is 8'6" and maximum 14'9".

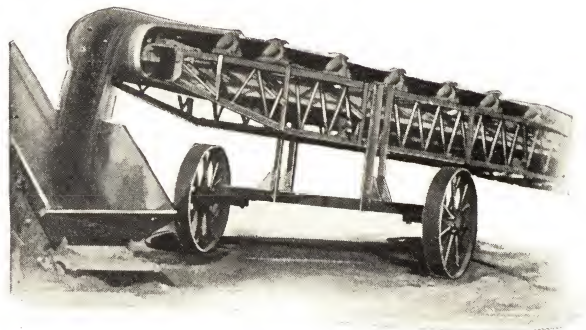
K-E truck is a combination of the K and the E trucks and can be adapted to special conditions. The conveyor shown on the first page is equipped with an E truck.

A plain truck, style P, consisting of an axle and two wheels can also be furnished.

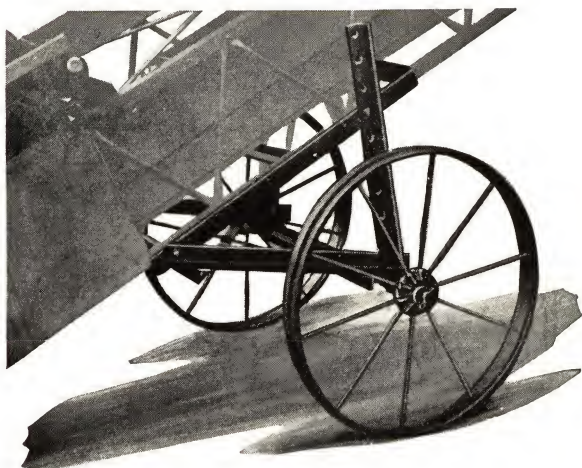
These trucks take machines with electric motors. If gasoline drive has to be used, refer to Aurora.



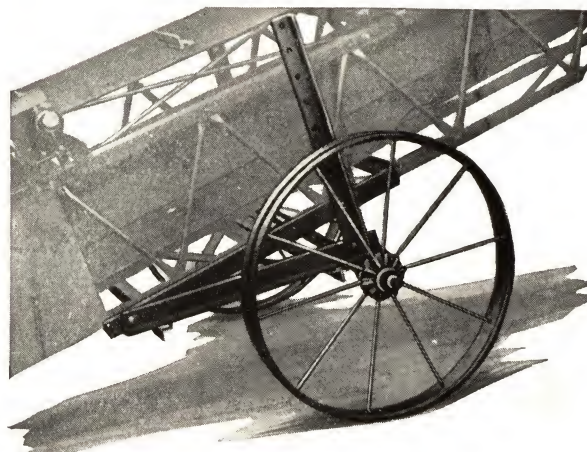
K-12 TRUCK



K-30



F TRUCK RAISED



F TRUCK LOWERED

A B-G Ditcher Replaces Pick and Shovel

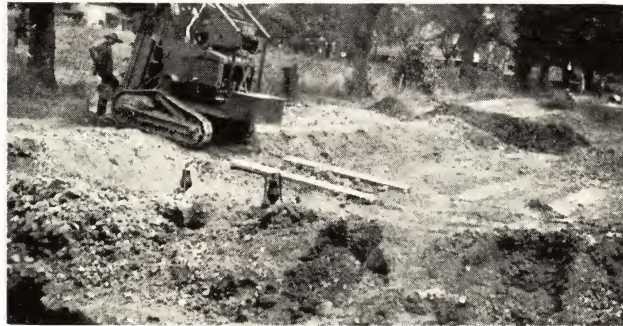
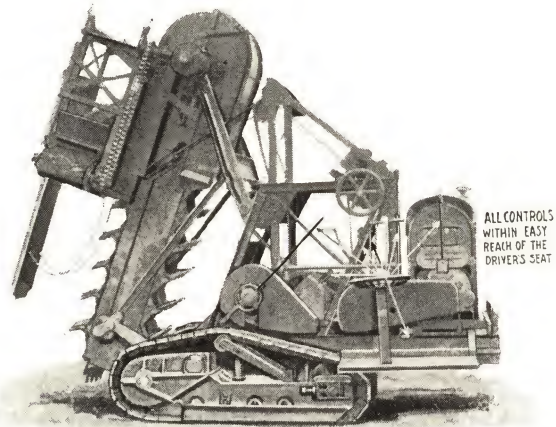
Results obtained by users of Barber-Greene ditchers are mainly: 1. Reduction of the shovel gang, 2. greater speed in trenching, 3. great reductions in cost. In addition, the Barber-Greene ditcher is able to dig ditches in close quarters where heretofore it has never been possible to use anything but a pick and shovel gang.

Among last year's users who have reordered more Barber Greene-Ditchers are included: Consolidated Gas Company, Syracuse Lighting Company, American Telephone & Telegraph Company and the Western United Gas & Electric Company.

The vertical-digging boom, the overload release sprocket, and the compact mounting on a mobile crawler unit makes the Barber-Greene Ditcher different from and superior to any machine designed for similar work. It will dig close to walls, trees, and other obstructions on the ground and under the ground.

Wide use under the severest of conditions has proved every phase of Barber-Greene construction practical—most practical in fact. And in this year's ditcher, we have given excess strength to every vital part without changing a basic idea.

Send the card now for your copy of **Modern Ditch Digging**. The results obtained by the many companies now using this ditcher are given in photographs, descriptions and even detailed costs. No obligation.



Just ready to begin a cut for service



Pavement broken, B-G ditch, bells cut by hand

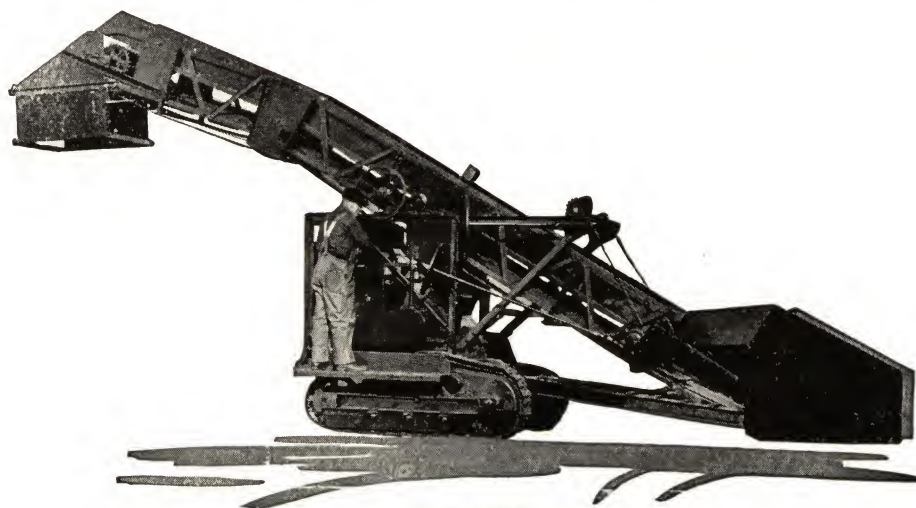


These ditches dug toward the center from each curb

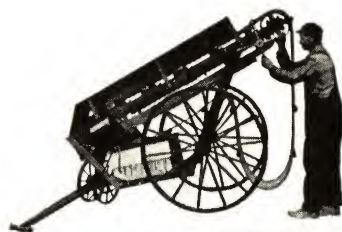


A straight ditch down an alley

OTHER BARBER-GREENE MACHINES



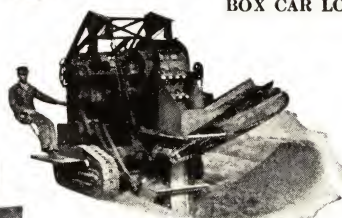
SNOW LOADER



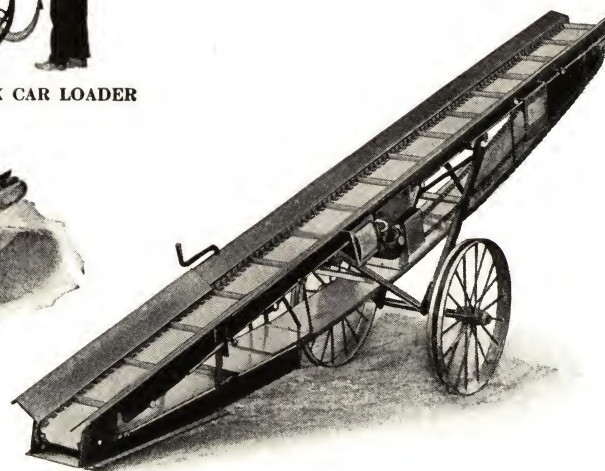
BOX CAR LOADER



BUCKET LOADER



DITCHER



TYPE U CONVEYOR

CAPACITIES OF B-G STANDARD CONVEYORS, in Tons per Hour

Based on Uniform and Continuous Loading.

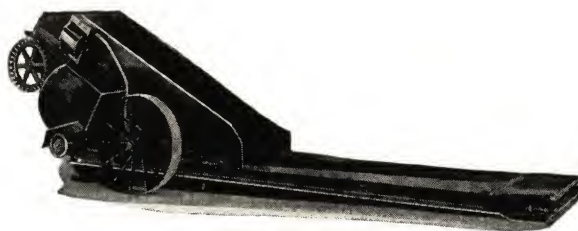
Kind of Conveyor	Belt Speed	Coke	Coal		Earth Dry	Clay Dry	Sand	Stone or Gravel	Ore Fine	Ashes	Bulk Cement	Salt	Bricks	Sacks, Boxes, Etc.	
			Fine	Lump											
18-N	270 Ft. min.	26	50	44	65	65	100	90	130	35	80	50			
18-O	180 Ft. min.	22	42	40	55	55	85	77		30	68	42			
24-N	270 Ft. min.	47	100	78	117	117	185	156	240	72	140	92			
24-O	180 Ft. min.	40	85	70	100	100	157	133		60	120	80			
REMARKS					Style O Conv. not recommended if material is wet. Do not use skirt plates on wet material.		Style N with plain belt recommended over Style O unless space demands shorter conveyors.		Recommend Belt with extra heavy cover.	If ashes are hot use Special Hot Material Belt.			Recommend Belt with extra heavy cover.	Cut down speed to 12½ ft. 1 min. Space carriers closer than std.	

FOR HANDLING BULK MATERIALS



COAL LOADER

The Coal Loader and the Coal Feeder are particularly designed for handling any kind of coal—lump or otherwise. The Coal Feeder can be placed underneath a car but over the rails, or into a track pit if desired. The machines are good auxiliaries to Style N conveyor, both in design and construction.

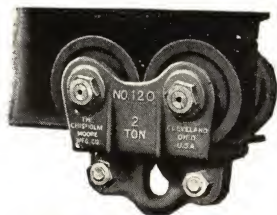


COAL FEEDER



I-BEAM TROLLEYS, CAST IRON FRAME

This combination makes for very substantial construction. The large wheels on the steel flanges operate very easily and much less head room is required than by the wood track trolleys and greater spans are allowable.



I-Beam Trolley No. 4

Capacity Pounds	Weight Pounds	Tread Diameter of Wheel Inches	For I-beams Inches
500	13	2	3 and 4
1000	29	2 3/4	5 and 6
2000	33	2 3/4	5 and 6
3000	52	4 1/2	6 and 7
4000	72	5 1/2	7 and 8

In ordering state size and weight of I-beam.

As shown at the left, a conveyor can be swung from a bail instead of mounted on wheels. I-Beam Trolleys and Hoists are then necessary.

SCREW CHAIN HOISTS

This is a powerful and easy-working block, made on the well-known principle of the worm and gear. Where a high-speed hoist is not needed, this hoist is suitable.



"Standard" Screw Hoist.

Capacity Tons	Height of Lift—Feet	Gross Weight Boxed Pounds	Shortest Distance Between Hooks Inches	Chain Overhauled to Raise One Ft. Feet
1 1/2	8	70	16	47
1	8	89	17	58
1 1/2	8	98	17	73
2	9	119	20	83
3	10	191	24	120

*Figures denote approximate height which blocks, with regular lengths of chain will lift from level on which operator stands.

For every additional foot of lift desired, two feet extra of both main and hand chain will be necessary.

HORSE POWER MOTORS OR GASOLINE ENGINES FURNISHED

Conveyor Length	15'	18'	21'	24'	27'	30'	33'	36'	39'	42'	45'	48'	51'	54'	57'	60'
18-N Electric	2	2	2	3	3	3	3	5	5	5	5	5	5	5	5	5
18-O Electric	2	2	2	3	3	3	5	5	5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2
24-N Electric	2	2	3	3	3	3	5	5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2
24-O Electric	3	3	3	3	3	5	5	5	5	5	5	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2
18-N and O Gas	NOT FURNISHED										2 Cylinder Le-Roi Engine—8 H. P.					4 Cyl. Le-Roi Eng. 13 1/2 H. P.
24-N and O Gas	Use TYPE U										2 Cylinder Le-Roi Engine—8 H. P.					4 Cylinder Le-Roi Engine—13 1/2 H. P.

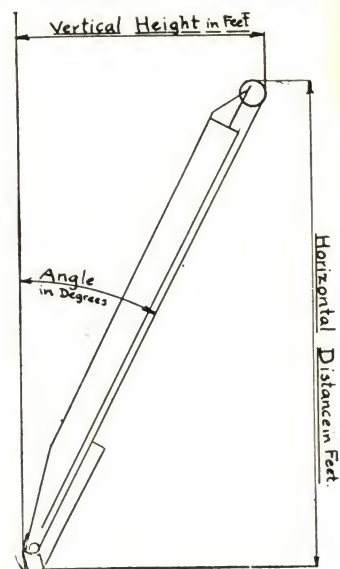


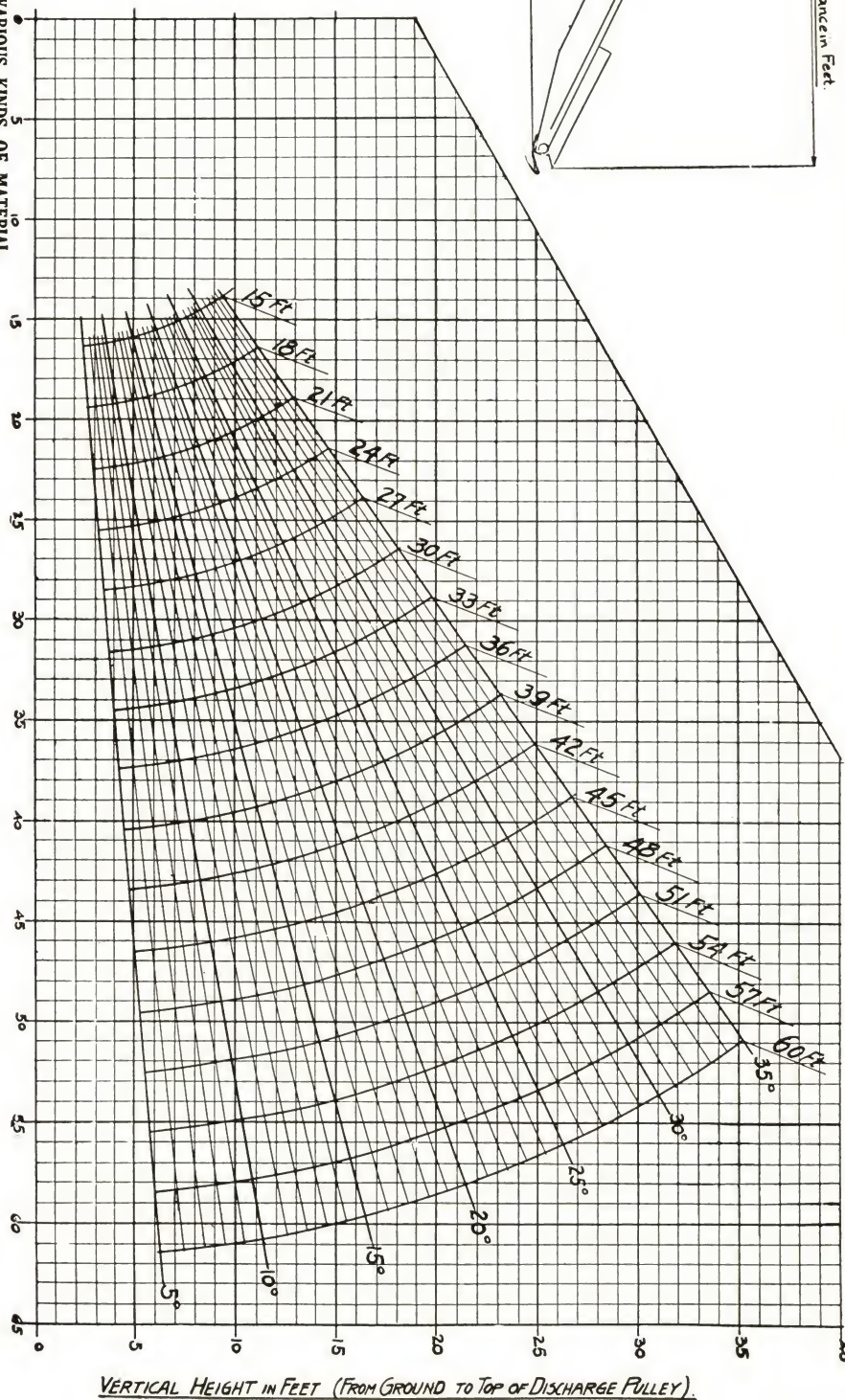
TABLE I

MAXIMUM ANGLES OF
INCINATION OF BELT CONVEYORS FOR VARIOUS KINDS OF MATERIAL.

MATERIAL	Plain Belt Conveyor	Cleated Belt Conveyor
COAL—Lump	15°	27°
Egg	18°	30°
Stove	20°	30°
Chestnut	22°	33°
Pea and Barley	22°	35°
Mine Run	18°	27°
COKE—Lump	20°	28°
Screened	18°	30°
Crushed 4" 2"	18°	30°
Stone 1"	20°	30°
Bank Run Sand and Gravel	18°	27°
Fine Dry Sand	20°	30°
Fine Wet Sand	28°	30°
Washed and Screened Pebbles	17°	35°
Silica Dry Sand	15°	25°
Pondry Tempered Sand	24°	18°
Earth Average Moist	25°	35°
Loose	22°	not be sticky.
Brick Stacked	25°	30°
Lime, Cement—100 lb. bags	23°	35°
Fresh Wood Chips	27°	35°
Bark	27°	35°

NOTE—By increasing the angle of operation the capacity of the conveyor is decreased. Cleats on belt will prevent material from sliding down on the belt, but they will not increase the capacity of the conveyor.

The above angles represent general average conditions. In certain instances the given angles can be increased; in other cases they may have to decrease. Good judgment should be exercised determining the angle at which to operate.



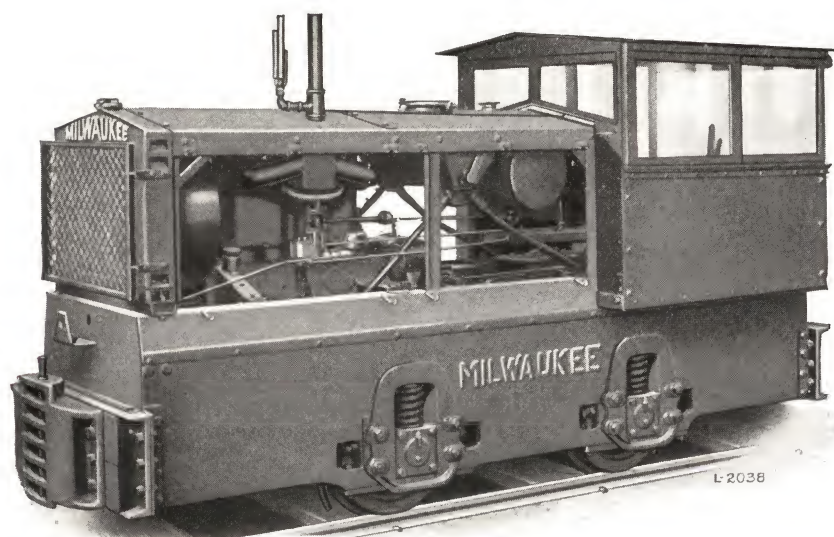
EXAMPLE I

A conveyor is needed to pile sand 20' high. Solution:—Table No. 1 shows a maximum angle of 25°. Start at extreme right vertical column marked 20 and follow horizontal line until it intersects diagonal line representing 25°. Then follow curved line to the top. This is marked 45 feet, and indicates that a 45-foot conveyor should be used.

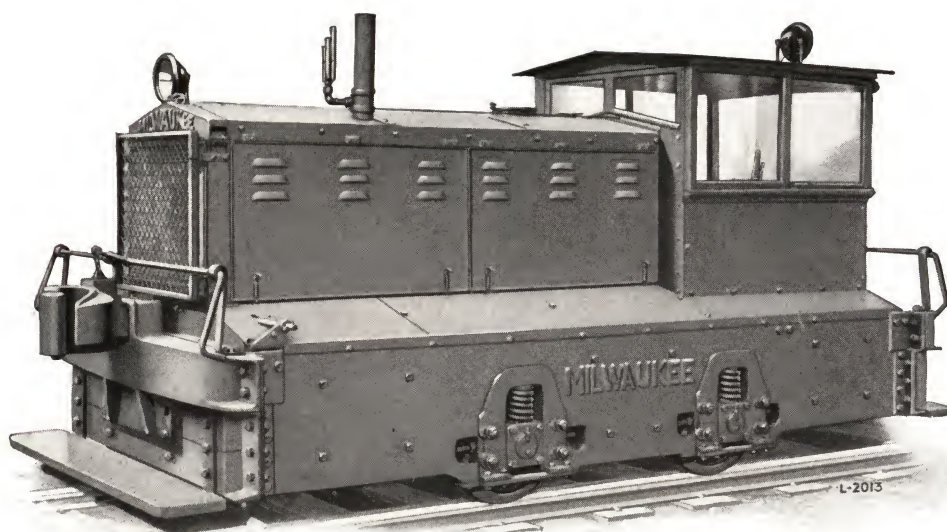
EXAMPLE II

How high will a 60' "O" (cleated belt) pile coal? Solution:—Table No. 1 shows 30° as the maximum angle for this material. Find the intersection of the 30° line and the curved line indicating a 60' conveyor. Follow the horizontal line to the right and read 31 feet—to the top of the pulley.

MILWAUKEE GASOLINE LOCOMOTIVES



Type "H-7", 7 Ton, 24" gauge, Milwaukee Locomotive with side covers removed. All type "H" Milwaukee Locomotives are of practically the same general design and can be furnished with couplers of the link and pin or standard M.C.B. type, as specified. Types "H-6", 6 Ton and "H-7", 7 Ton Locomotives are powered with Beaver model "JE," four cylinder, heavy duty engines of the latest and most advanced design.

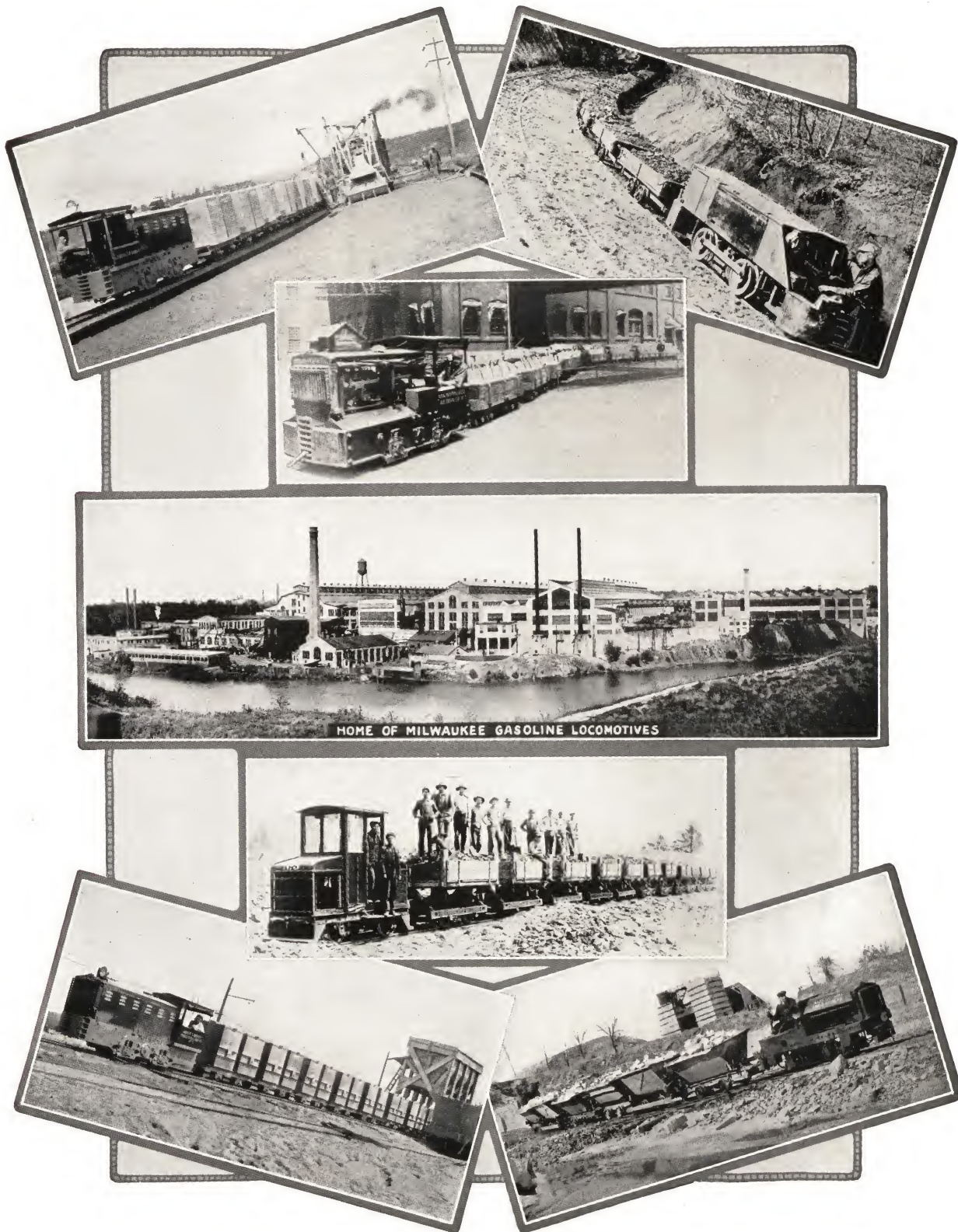


Type "H-10", 10 Ton, 56 $\frac{1}{2}$ " gauge, Milwaukee Gasoline Locomotive with standard M.C.B. couplers and electric lights and starter. The "H-9", 9 Ton and "H-10", 10 Ton models are powered with Beaver model "JD", six cylinder, heavy duty engines, and are furnished with either link and pin or standard M.C.B. type of couplers as specified. These larger types are ideally adapted for switching and spotting standard freight cars.

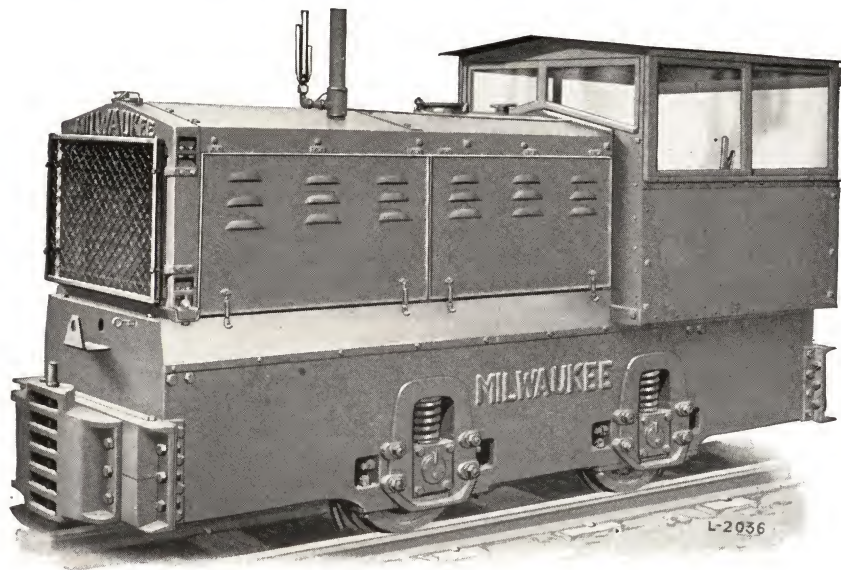
TYPE "H-15", 15 TON MILWAUKEE LOCOMOTIVE

Type "H-15", 15 Ton, Milwaukee Locomotive is of the same general design as the smaller models and is powered with the Beaver model "RA", six cylinder, heavy duty engine. This 15 ton locomotive is furnished for track gauges of 36 to 56 $\frac{1}{2}$ " inclusive, and is equipped with electric lights and starter.

MILWAUKEE GASOLINE LOCOMOTIVES



MILWAUKEE GASOLINE LOCOMOTIVES



Type "H-6", 6 Ton, 36" Gauge Milwaukee Locomotive.

MILWAUKEE TYPE "H" FOUR SPEED, GEAR DRIVE, LOCOMOTIVES
FOR ROAD BUILDERS, CONTRACTORS & GENERAL INDUSTRIAL HAULAGE

Milwaukee Type "H" Gasoline Locomotives manufactured by the Milwaukee Locomotive Mfg. Co. of Milwaukee, Wis., are designed to meet the present day needs in the industrial haulage field, and are the result of over 17 years of constant effort and experience in the successful development and perfection of gasoline motive power for industrial track haulage.

And while Milwaukee Locomotives have always maintained an undisputed leadership, the Type "H" model sets a new standard in both design and construction, provides greater flexibility of power and speeds and the utmost in haulage economy.

The specifications embody the same high quality of materials and workmanship for which Milwaukee Locomotives have become so well known. Many noteworthy improvements have been incorporated in their design which a careful study and wide experience have shown to be desirable to best meet the present day requirements.

Type "H" Locomotives are of the gear drive type, built in one standard design, in sizes from $3\frac{1}{2}$ to 15 Tons, and for all gauges of track. They have four speeds of two, four, six and twelve miles per hour both forward and reverse, and are powered with heavy duty engines of the very latest and most approved design.

There are many outstanding features, exclusive with Milwaukee Locomotives that will have a strong appeal to those who appreciate simplicity, sturdiness in construction, accessibility to all working parts, dependability in service and low cost of operation and maintainance.

There's a Type "H" Milwaukee of the right size to meet every requirement in the road building, contracting and general industrial fields.

Descriptive catalog No. 129, complete specifications and prices will be furnished on request.

FRAME: Massive semi-steel side frames with reinforced channel iron end sills.

COUPLERS: Link and pin or standard M.C.B. type, as specified.

AXLES: Turned from steel forgings (1035 S.A.E.) and heat treated.

AXLE SPROCKETS: High grade steel, accurately cut.

JOURNAL BEARINGS: Hyatt roller "Heavy Duty" type, with hardened steel solid inner and outer sleeves.

JOURNAL BOXES: Dust proof, fitted with renewable bronze thrust plates.

JOURNAL BOX YOKES: Made of steel, so designed as to provide for chain adjustments.

SPRINGS: Tempered coil springs over each journal box.

WHEELS: Rolled steel, "H-3" and "H-4", 18"; "H-6", "H-7", "H-9" and "H-10", 24"; and "H-15" 30" diameter.

CAB: All steel, with wire glass window over hood, wire glass sliding windows and rear curtain.

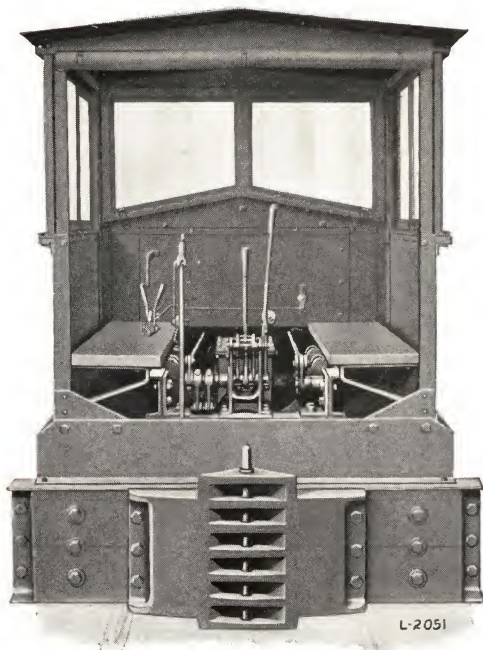
HOOD: Sheet steel, automotive type, with four removable hinged side covers.

ENGINE: "H-3", 3 ton, and "H-4", 4 ton, Hercules model "0", four cylinder; "H-6", 6 ton, and "H-7", 7 ton, Beaver model "JE", four cylinder; "H-9", 9 ton, and "H-10", 10 ton, Beaver model "JD", six cylinder; "H-15", 15 ton, Beaver model "RA" six cylinder.

GOVERNOR: All engines are equipped with maximum speed regulating governors.

IGNITION: Eisemann high tension magneto with impulse starting coupling.

MILWAUKEE GASOLINE LOCOMOTIVES



Cab end view of Type "H-3", 3½ Ton, 36" gauge locomotive. The seat arrangement and convenient location of operating levers in type "H" locomotives differs from most others in that the operator is seated crosswise in the cab. This is the most practical position for the operator when driving in either direction.

CARBURETOR: Wheeler Schebler with low and high speed adjustments.

AIR CLEANER: All engines are equipped with automatic air cleaners.

ELECTRIC LIGHTS AND STARTER: Types "H-3," "H-4," "H-6" and "H-7" locomotives do not have electric lights and starter as standard equipment. When specified however types "H-3" and "H-4" will be furnished equipped with 6 volt and the "H-6" and "H-7" types with 12 volt Leece-Neville lighting and starting systems and Westinghouse storage batteries. All Types "H-9," "H-10" and "H-15" locomotives are equipped with Leece-Neville 12 volt lighting and starting systems, and Westinghouse storage batteries.

COOLING: Sectional radiator, fan and centrifugal water circulating pump.

CLUTCH: Heavy duty, multiple disc, dry plate type.

TRANSMISSION: Jaw clutch and gear type, four speeds forward and four speeds reverse.

DRIVE CHAINS: Highest grade heavy roller type.

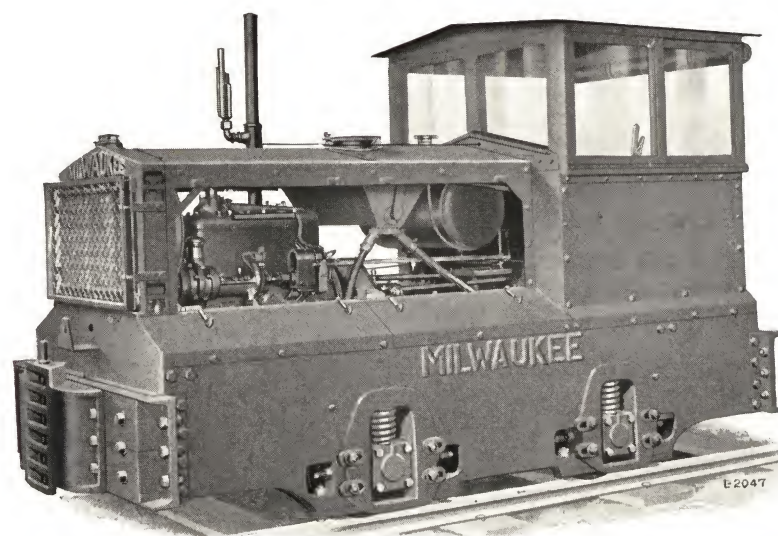
BRAKE: Types "H-3," "H-4," "H-6," "H-7," "H-9" and "H-10", hand operated, drum type. Type "H-15" hand operated, wheel type.

SANDERS: One sander box with agitating valves, operated by hand lever.

GASOLINE TANK: Located so as to assure positive gravity feed.

LUBRICATION: All engines of Milwaukee Locomotives have force feed lubrication. All bearings except those of the engine and transmission have Alemite fittings.

SIGNAL: Chime whistle.



Type "H-4", 4 Ton, 36" gauge Milwaukee Locomotive with side covers removed, showing simplicity of construction and extreme accessibility to all working parts. Type "H-3", 3½ Ton, and "H-4", 4 Ton locomotives are powered with the well known Hercules model "O", four cylinder heavy duty engines. The cab and hood of all type "H" locomotives are of reinforced sheet steel construction, the cab having wire glass window over hood, wire glass sliding side windows and rear curtain.

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